

# THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

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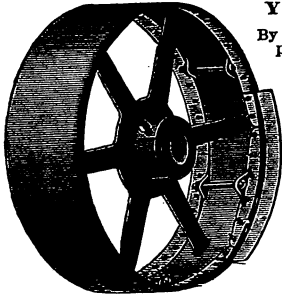
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Classified List of Advertisers... " 115  
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Advertising and Subscription Rates " 1123

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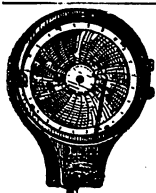
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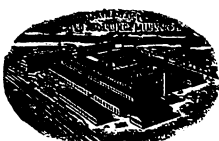
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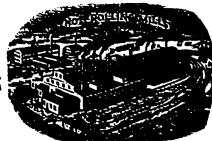
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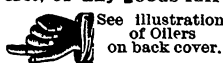
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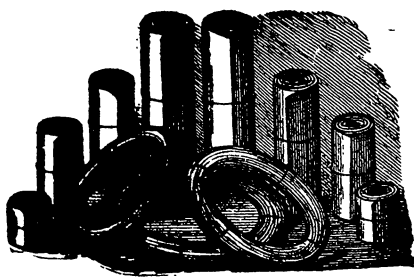
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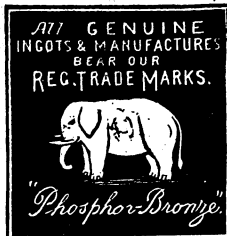
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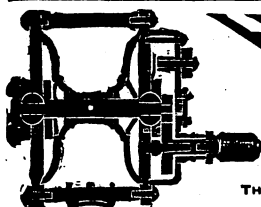
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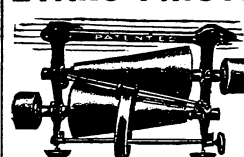
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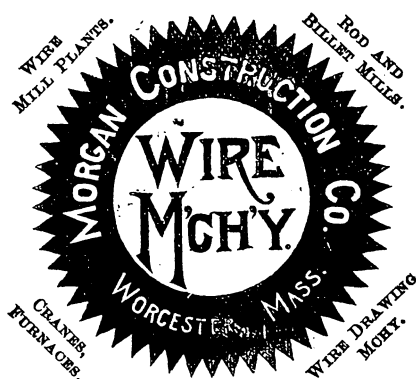
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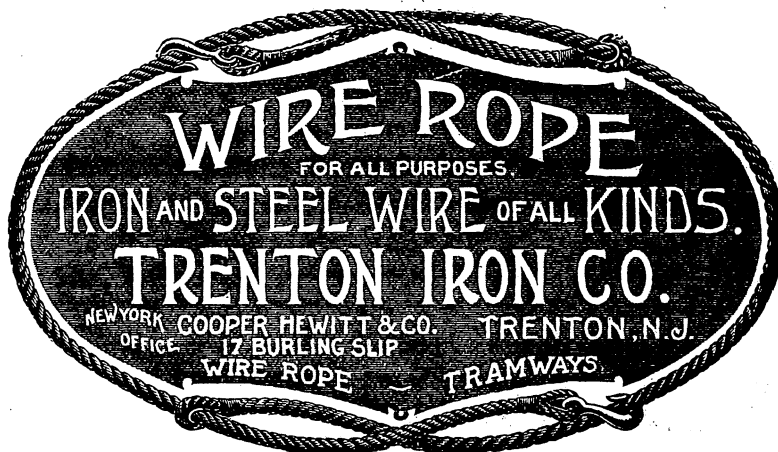
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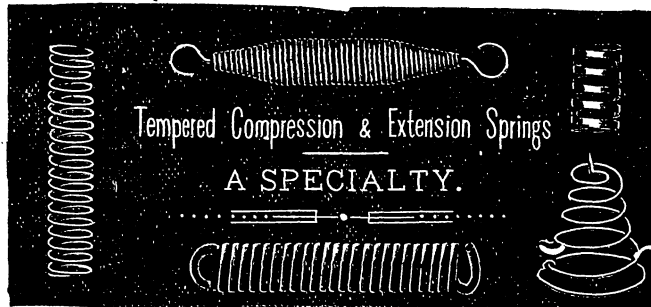
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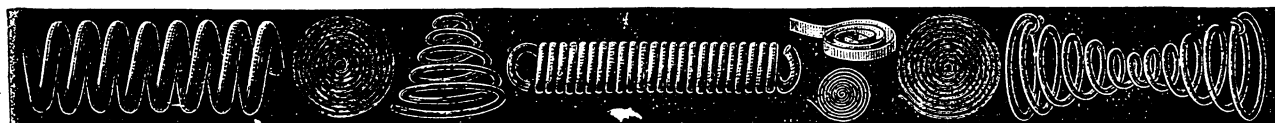
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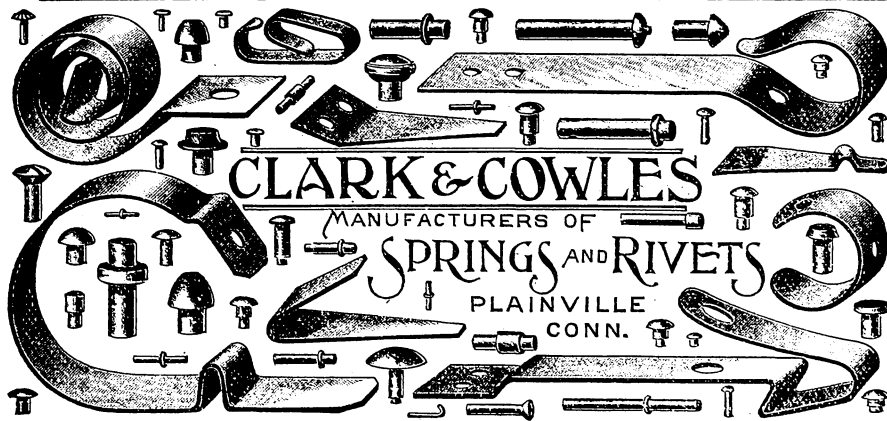
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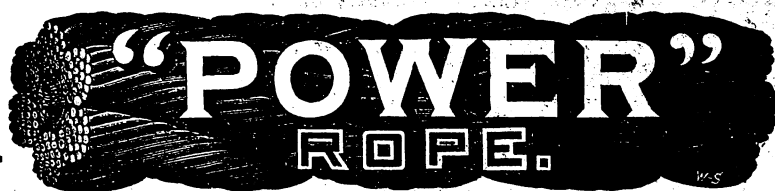
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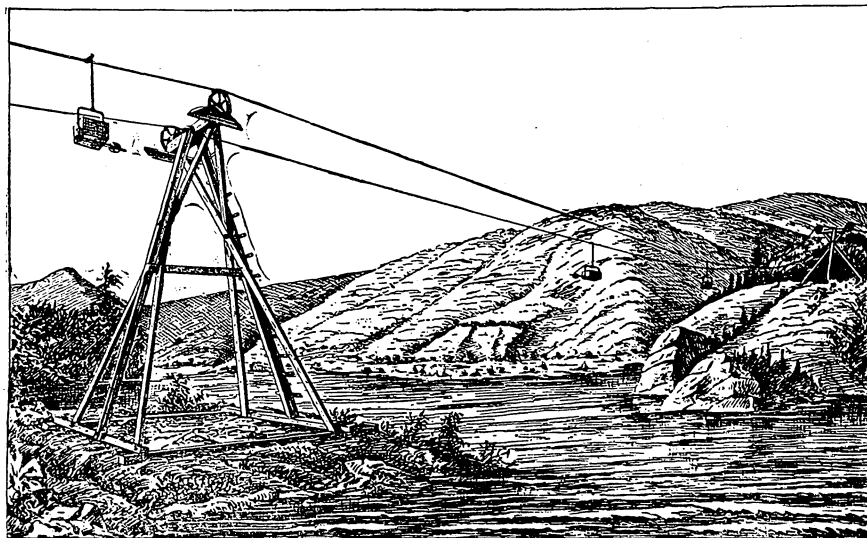


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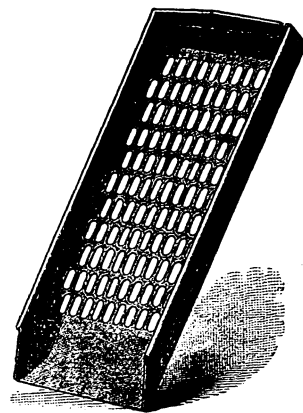
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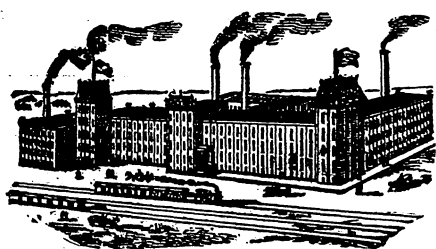
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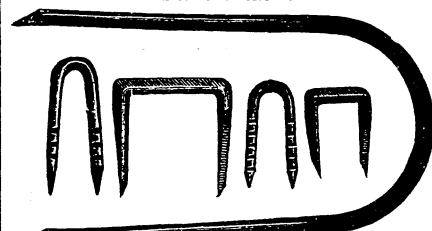
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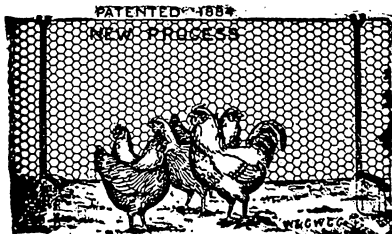
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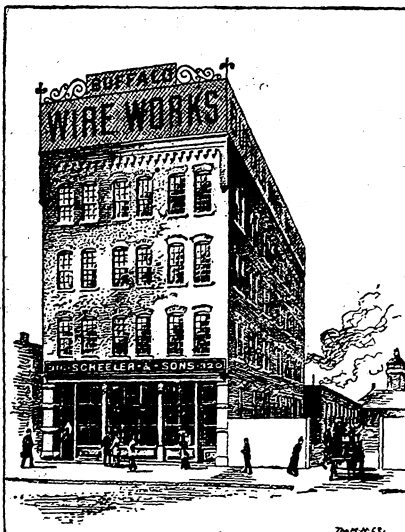
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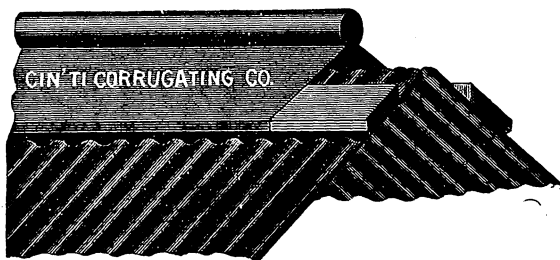
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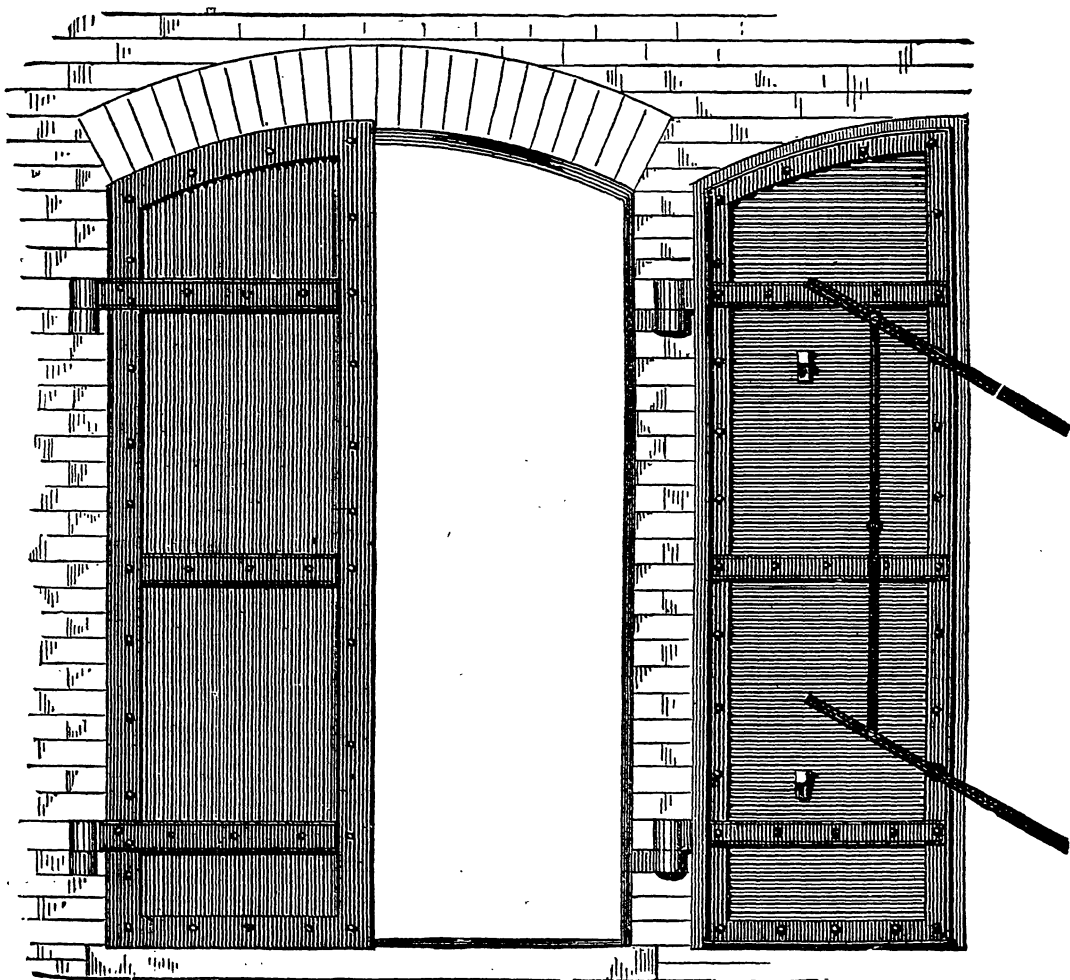
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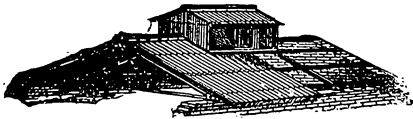


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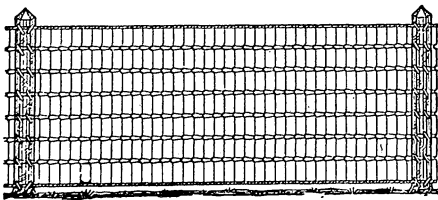
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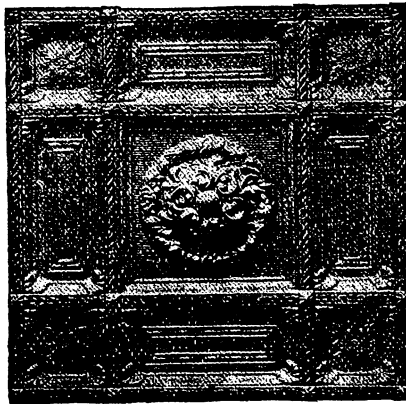
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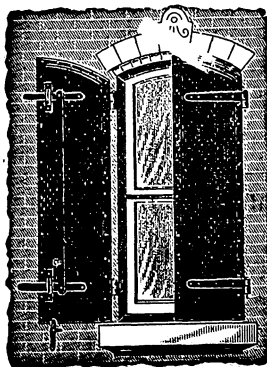
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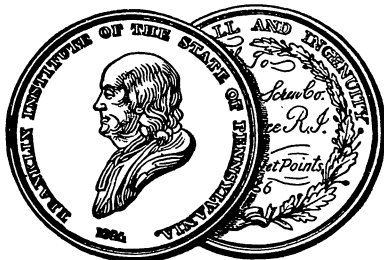
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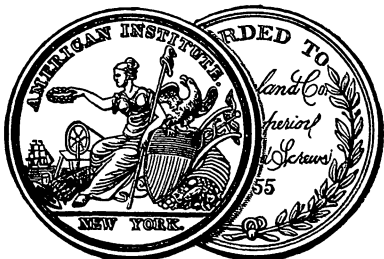
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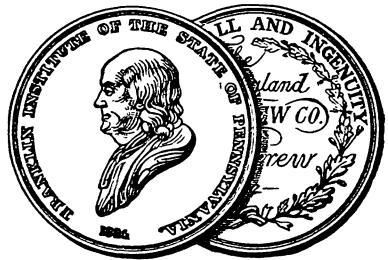
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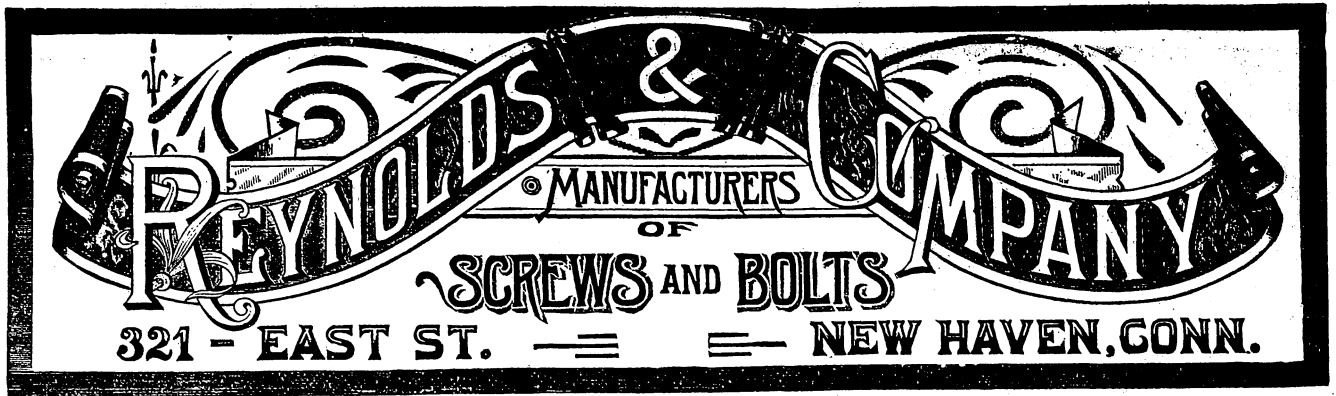
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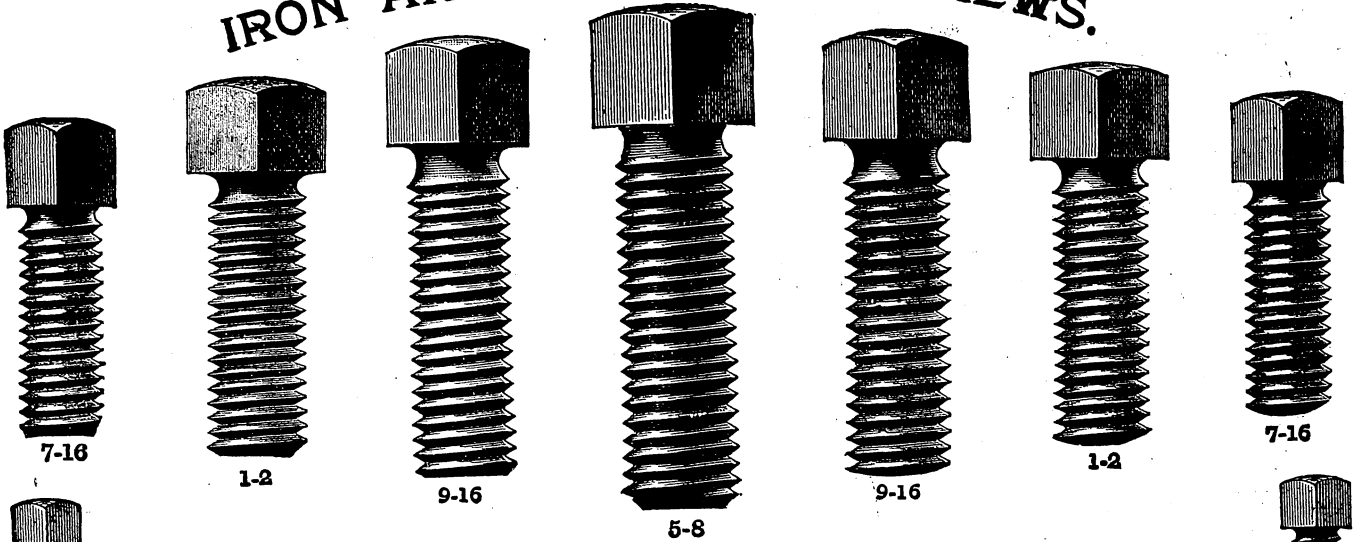
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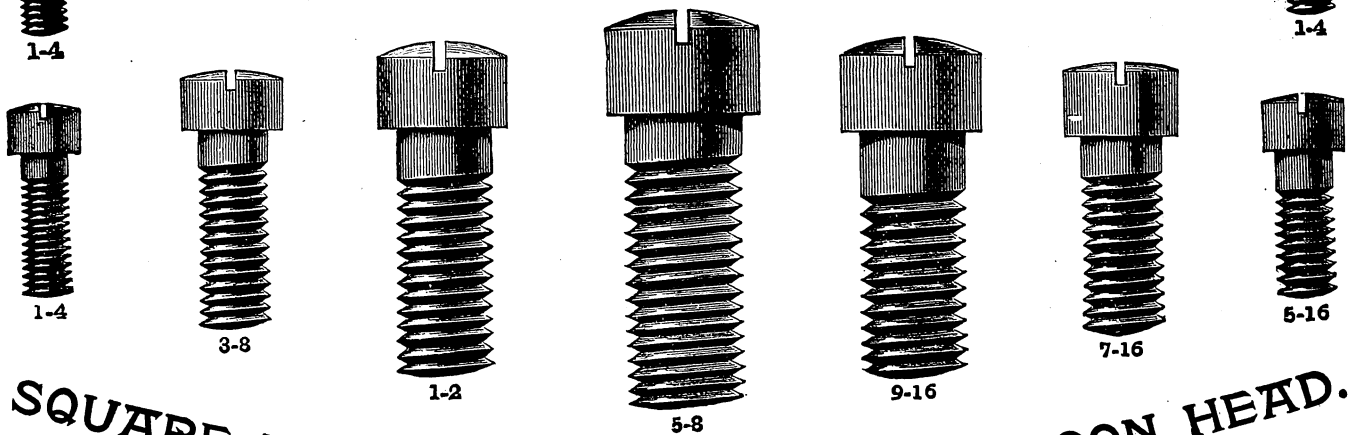
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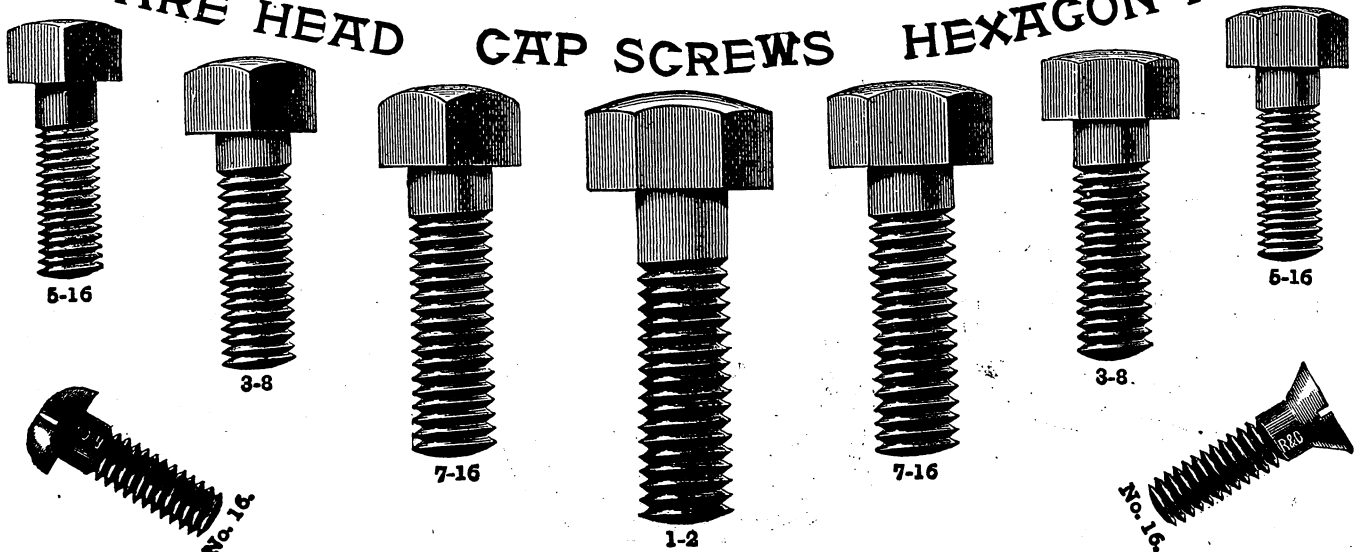
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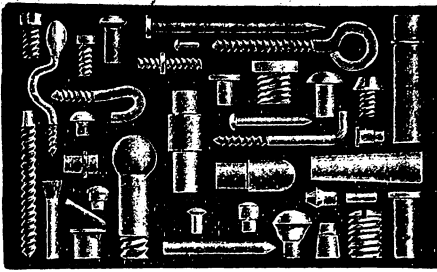
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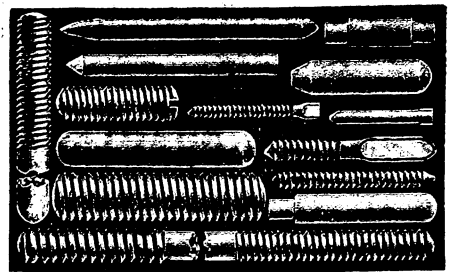
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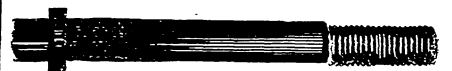
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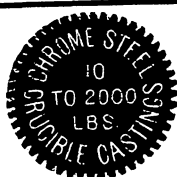
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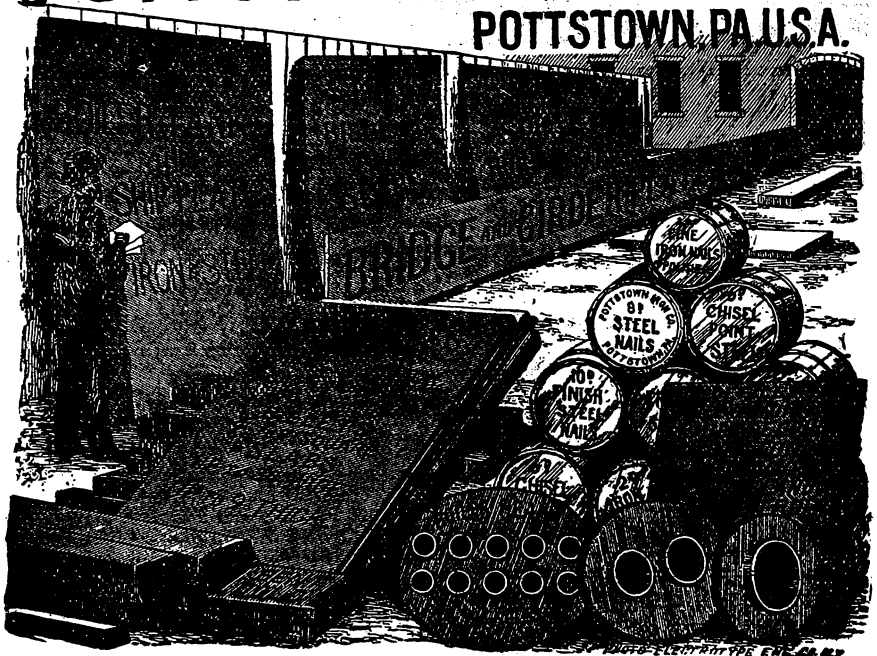
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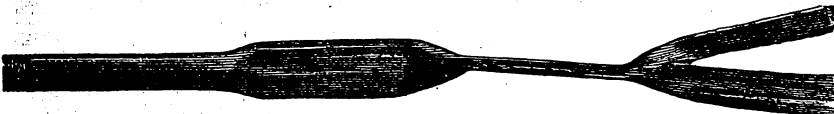
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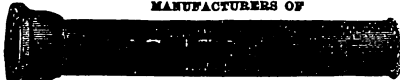
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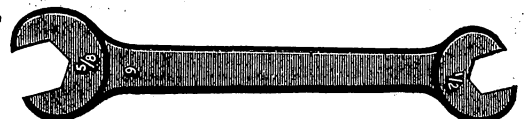
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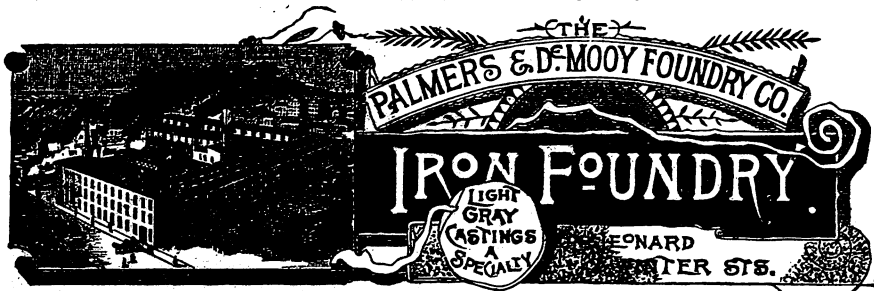
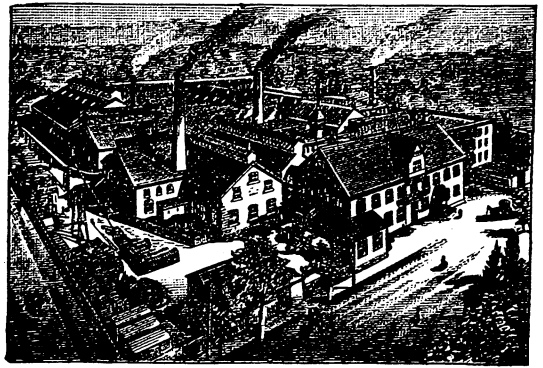
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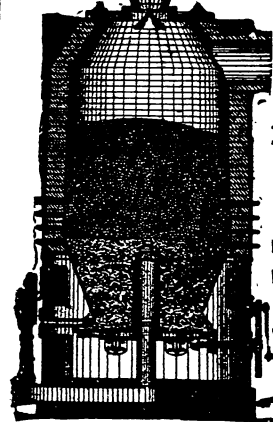
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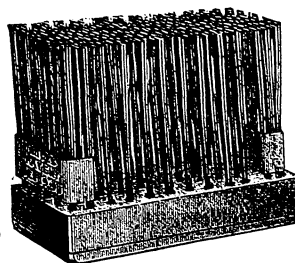
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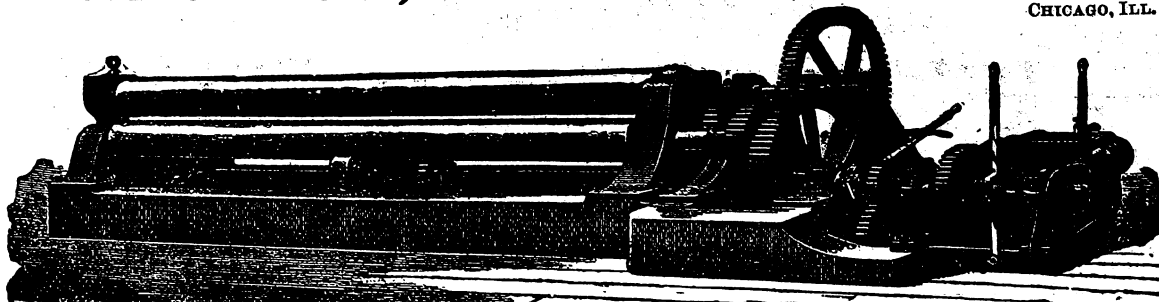
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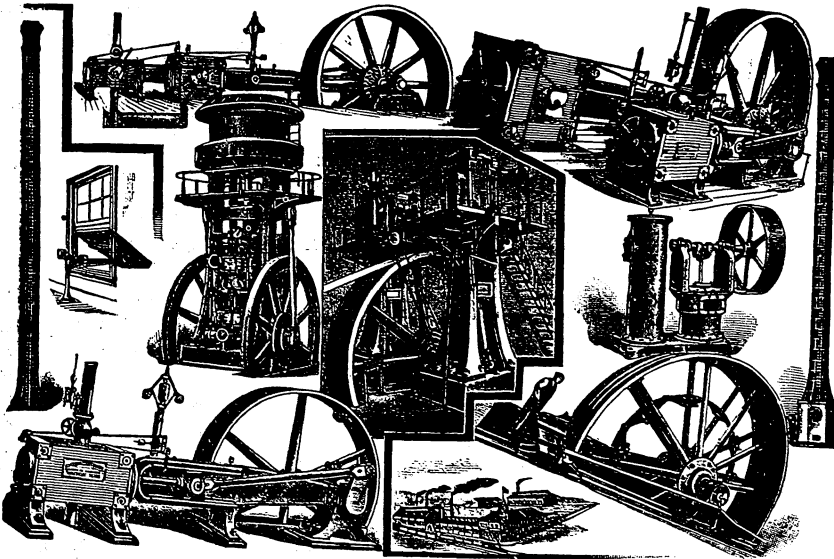
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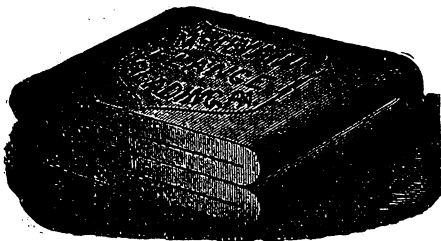
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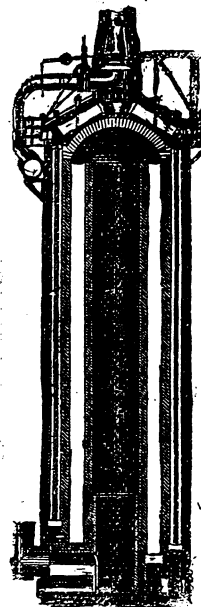
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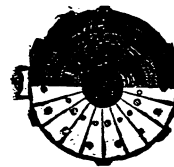
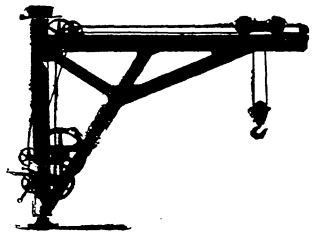
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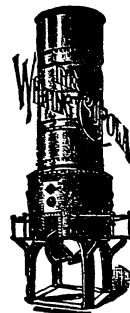
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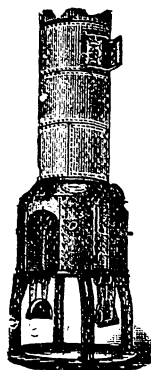
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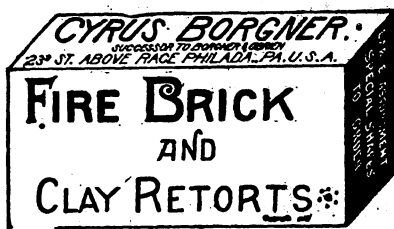
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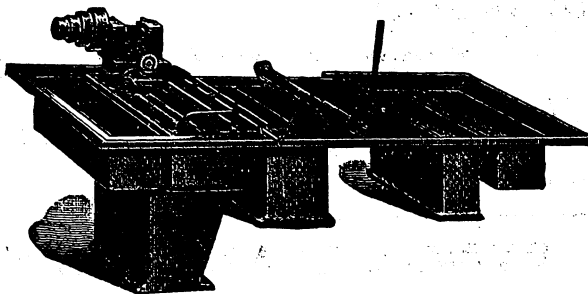
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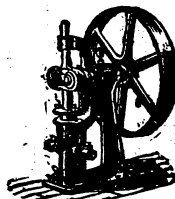
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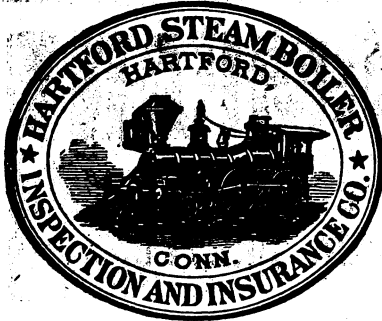
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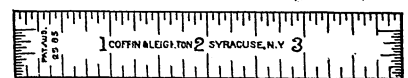
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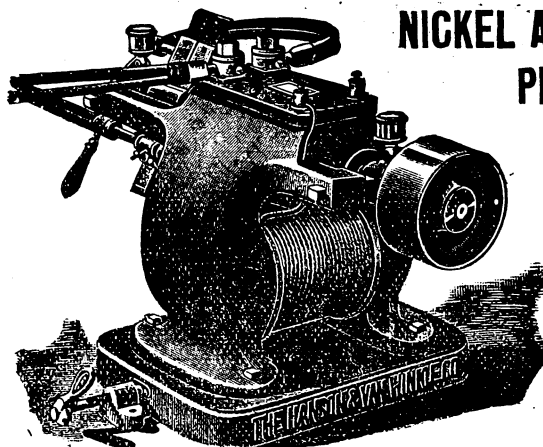
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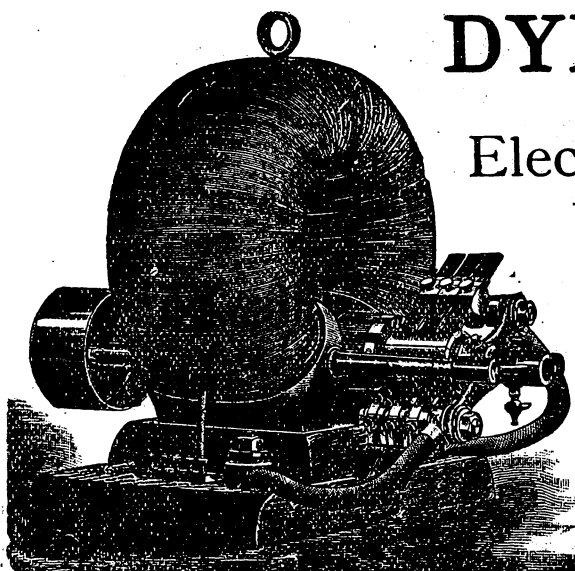
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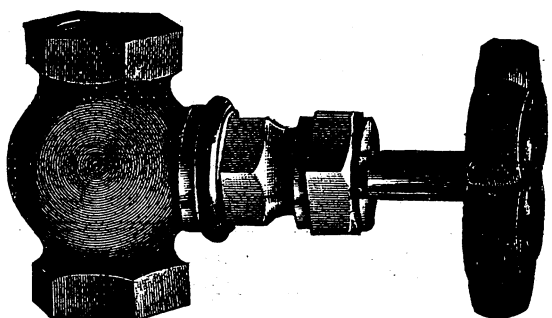
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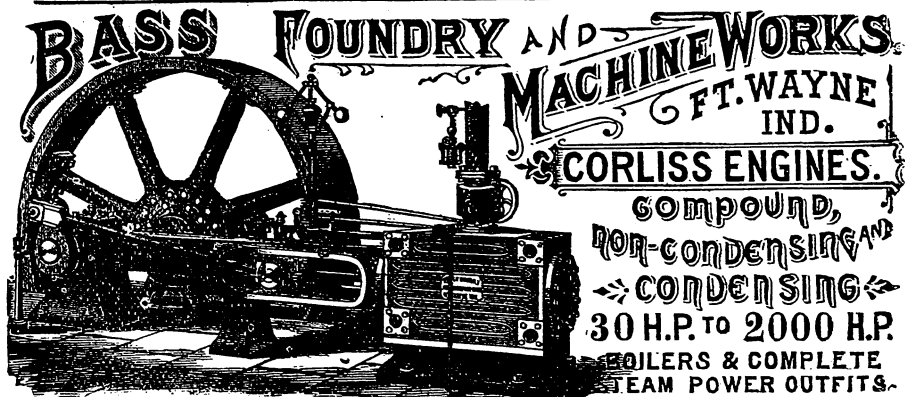
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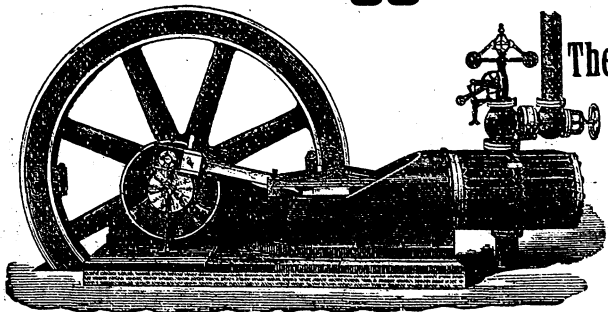
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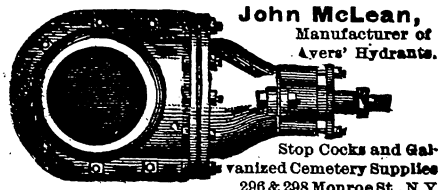
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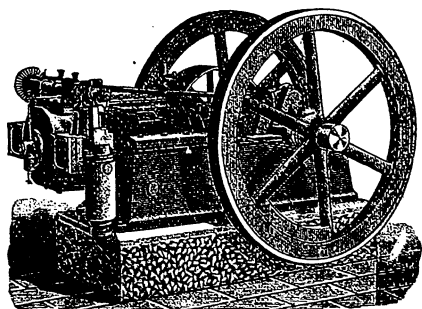
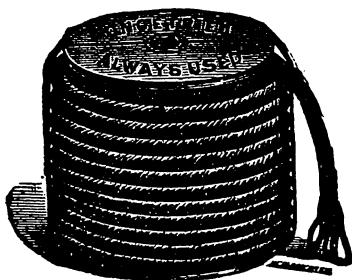
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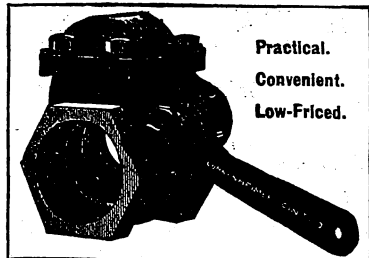
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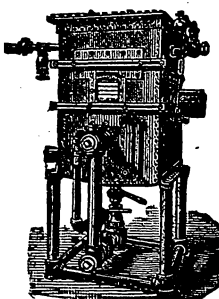
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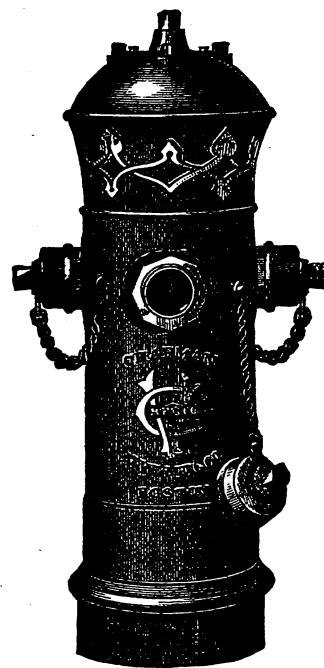
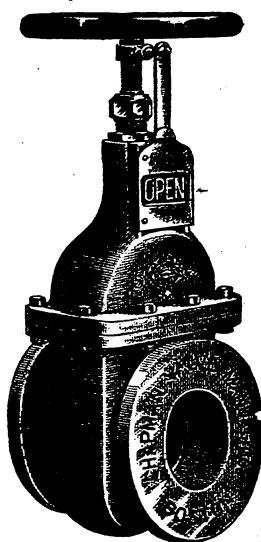
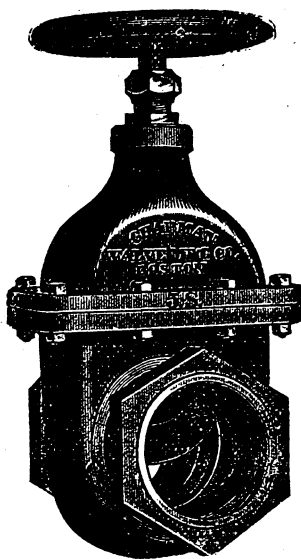
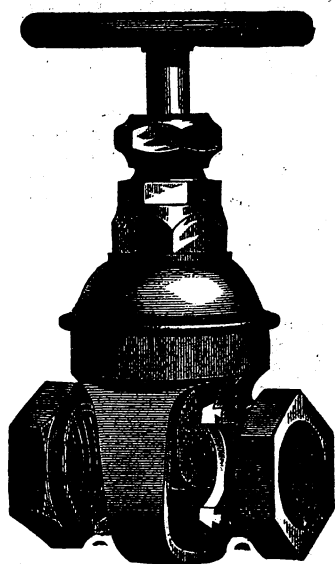
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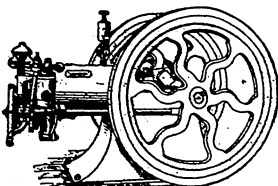
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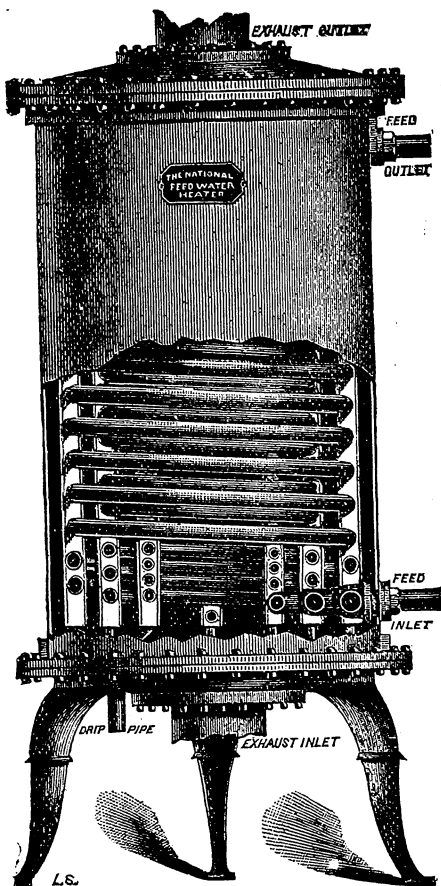
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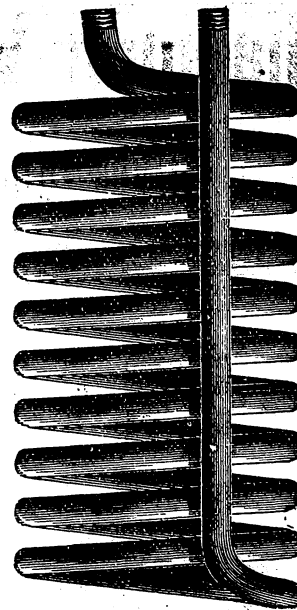
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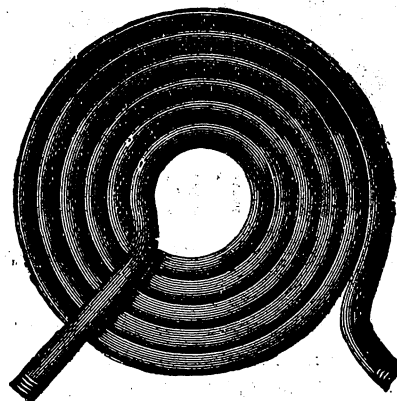
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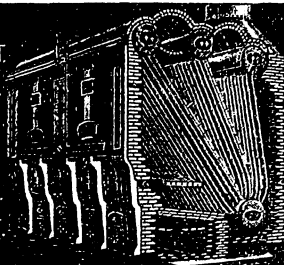
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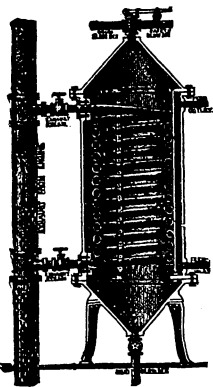
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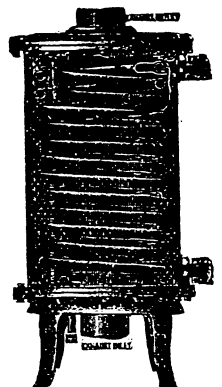
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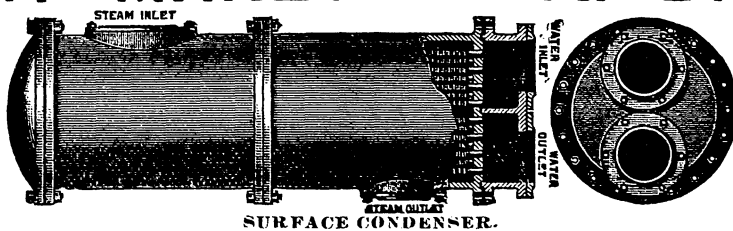
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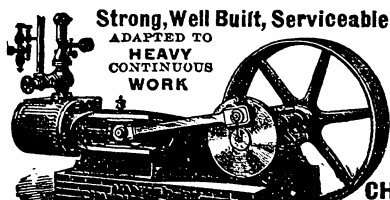
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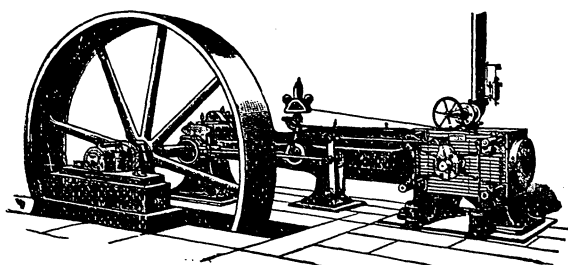
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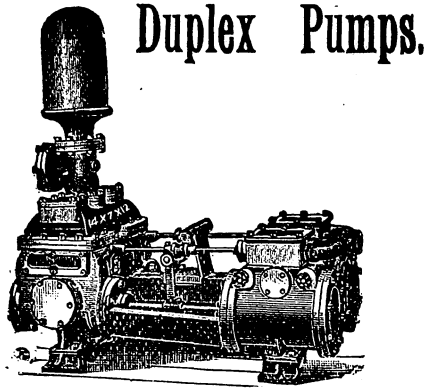
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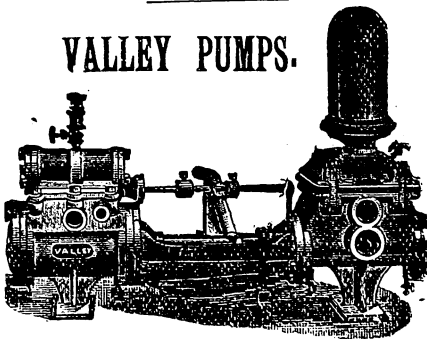
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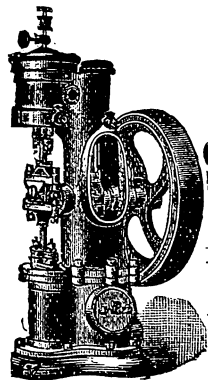
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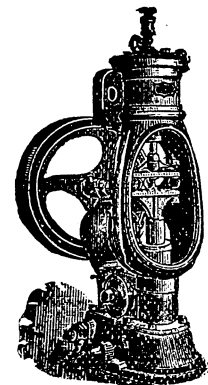
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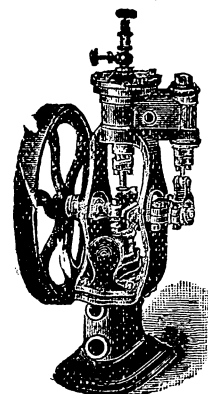
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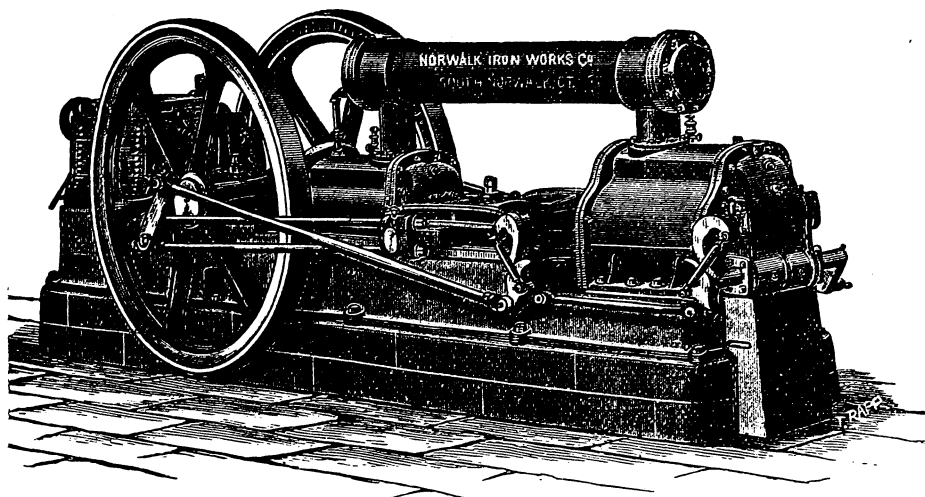
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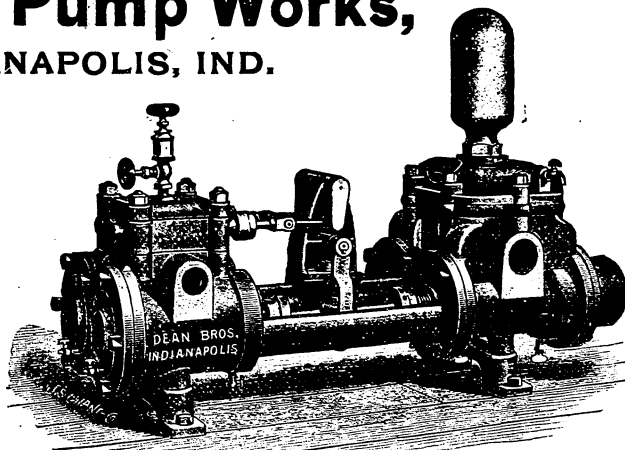
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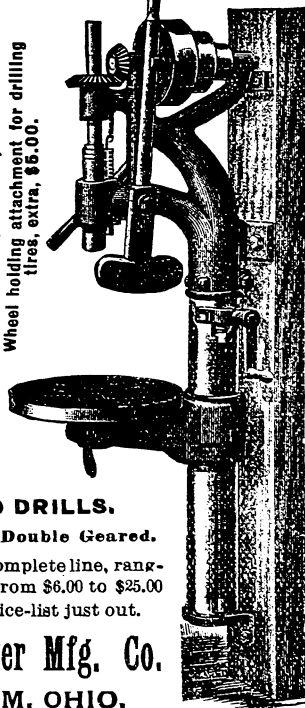
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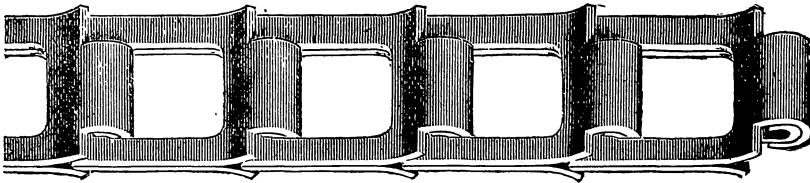
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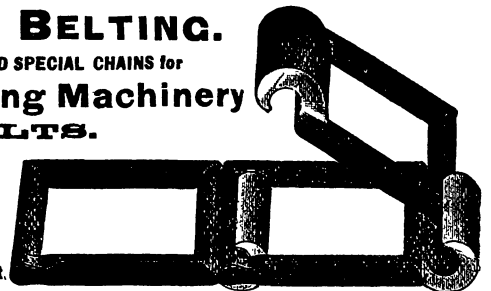
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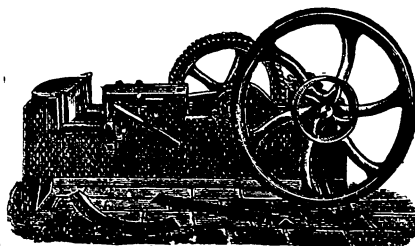
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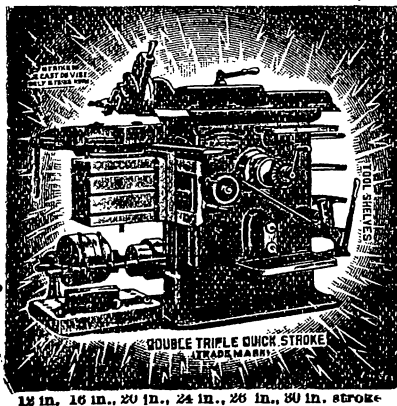
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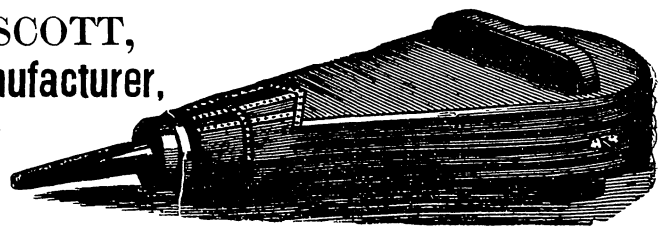
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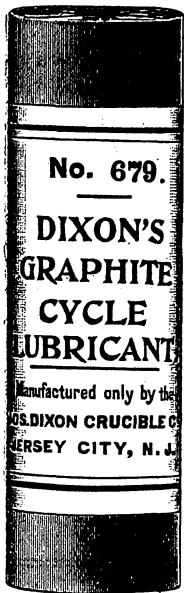


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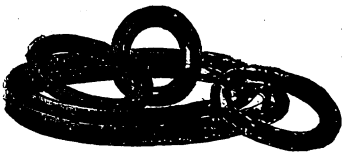


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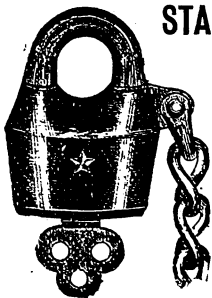


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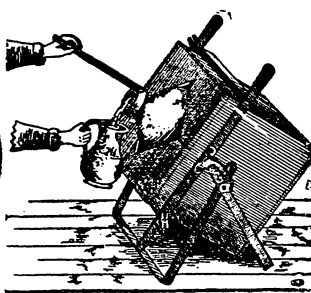
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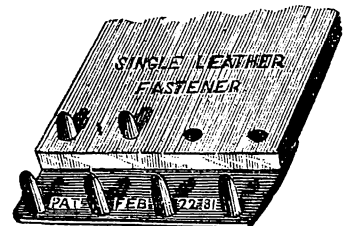
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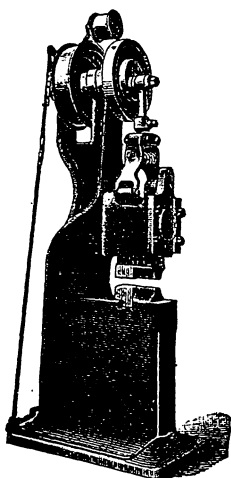
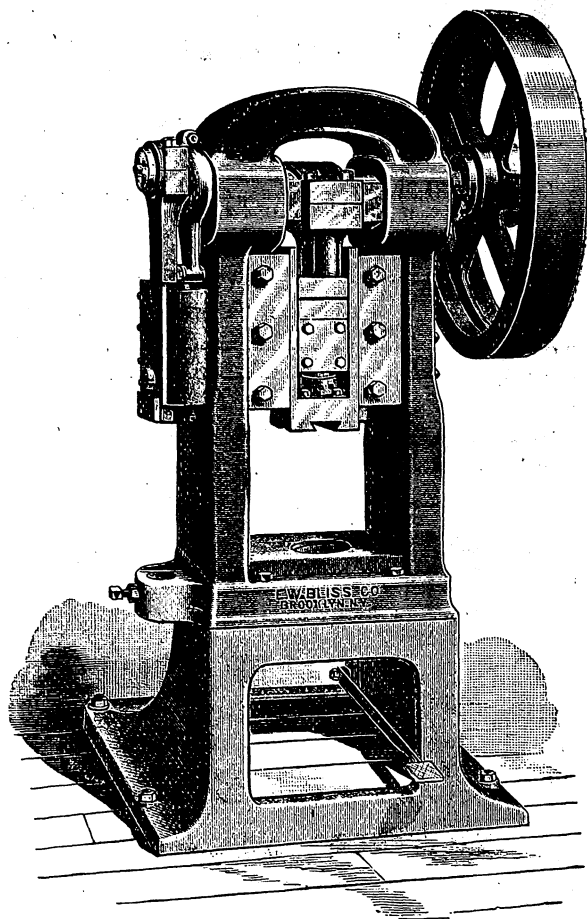
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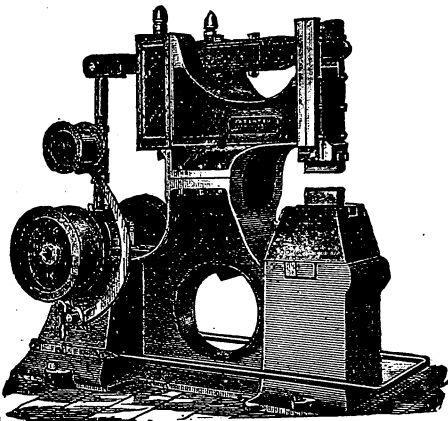
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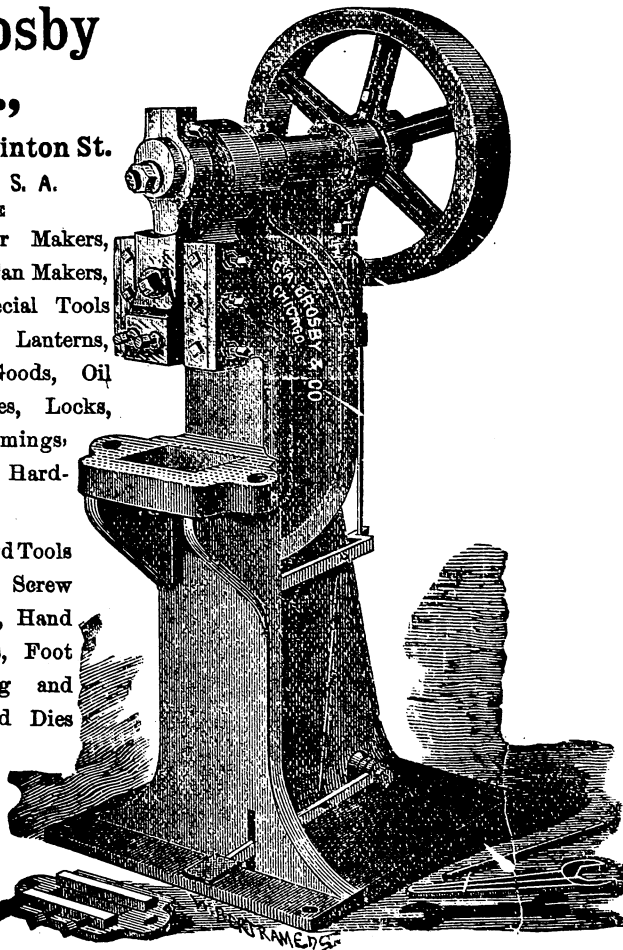
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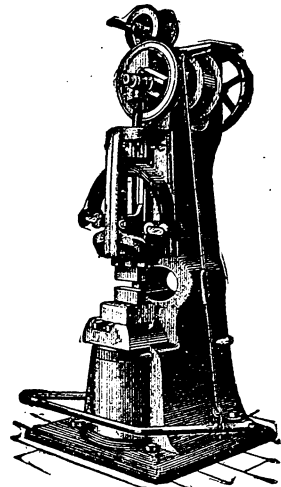
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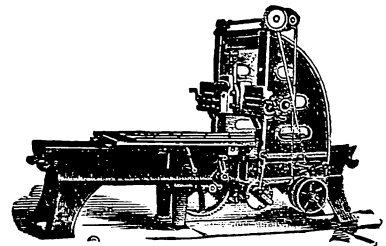
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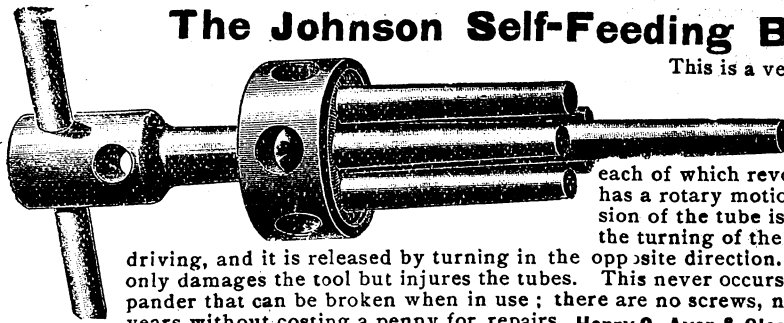


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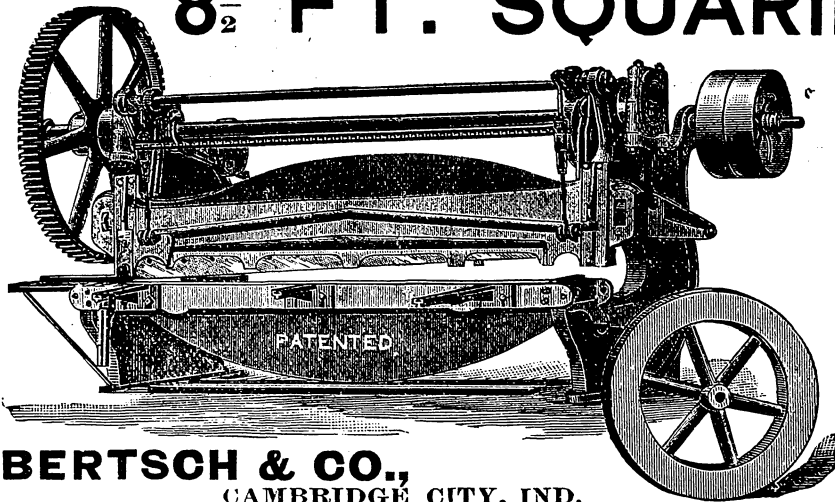
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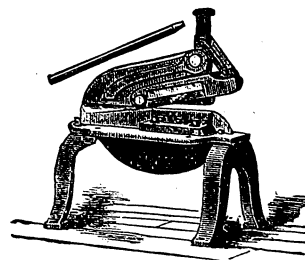
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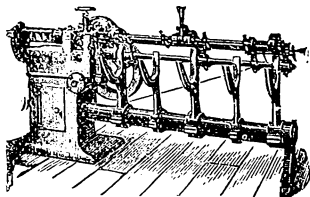
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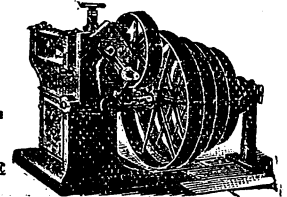
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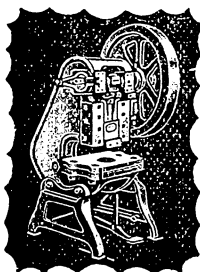


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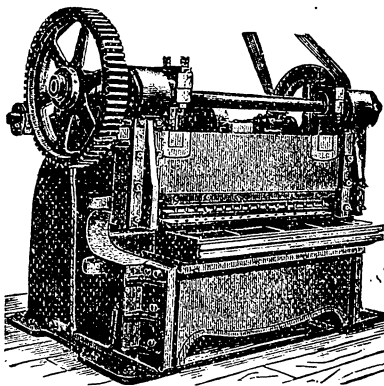
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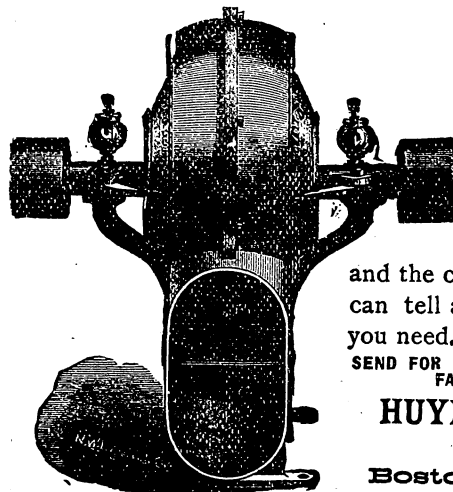


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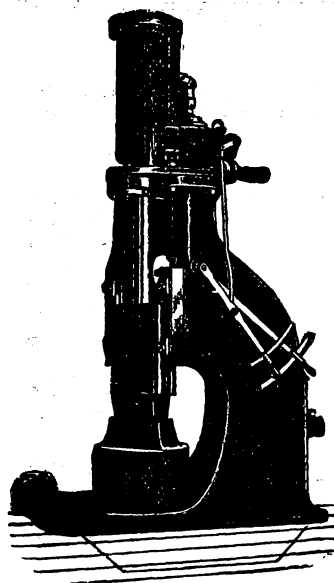
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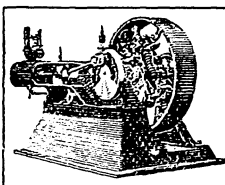
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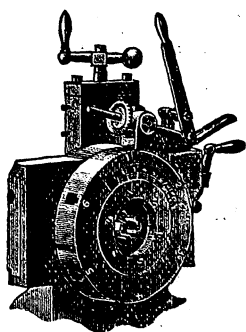
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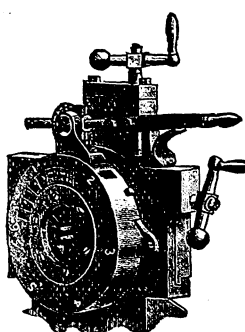
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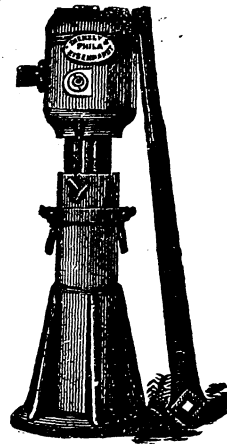
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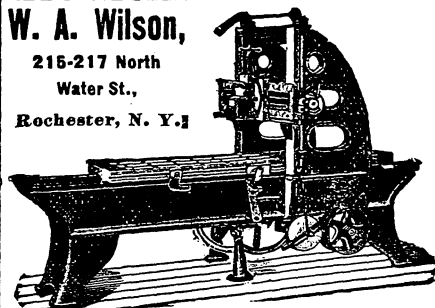
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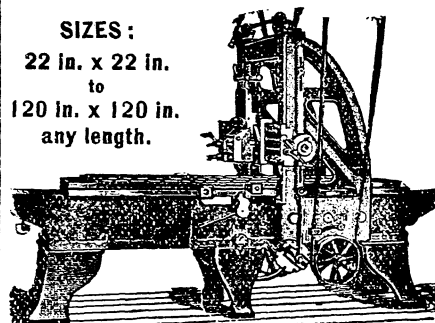
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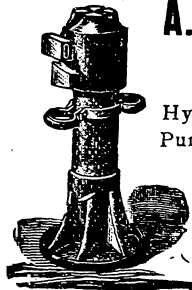
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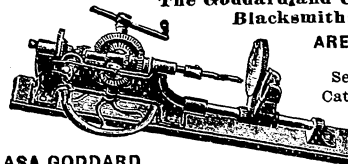
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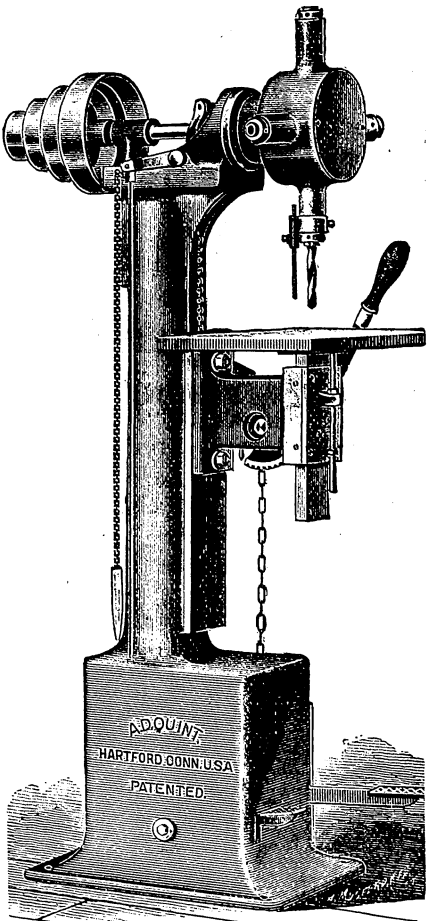
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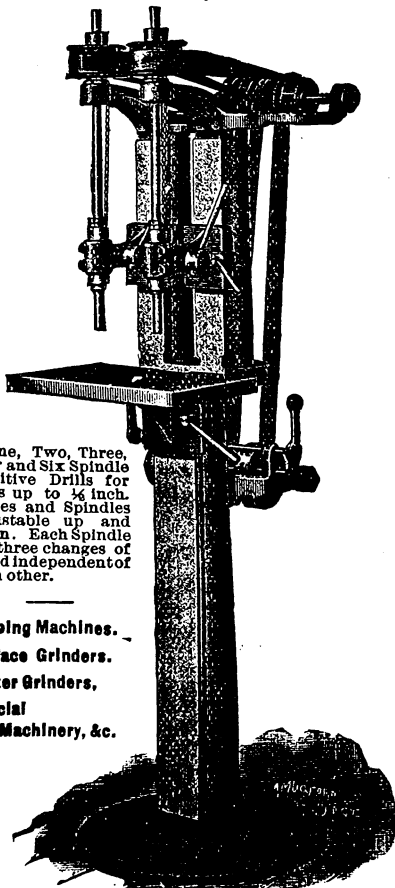
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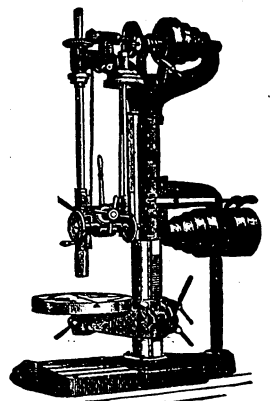
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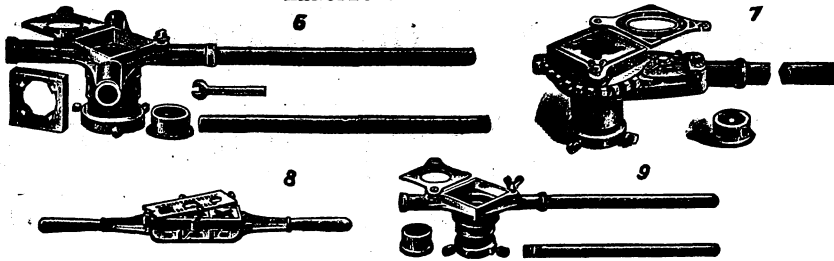


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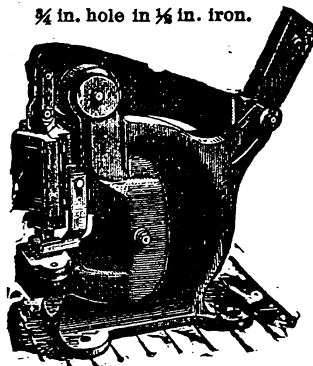
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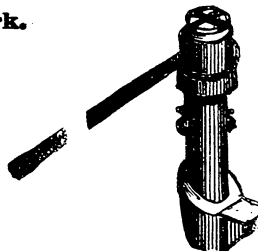
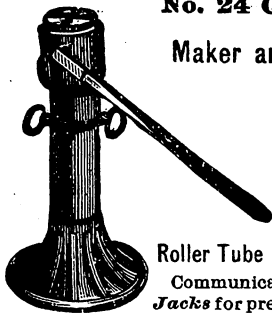
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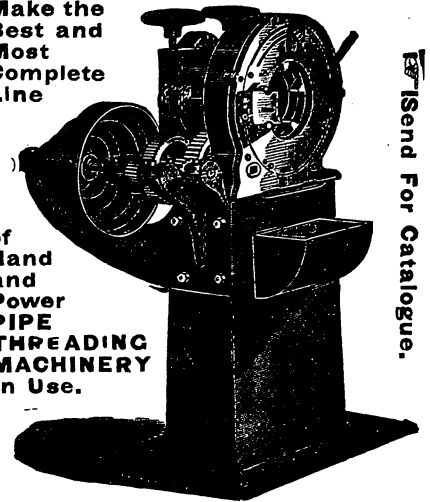
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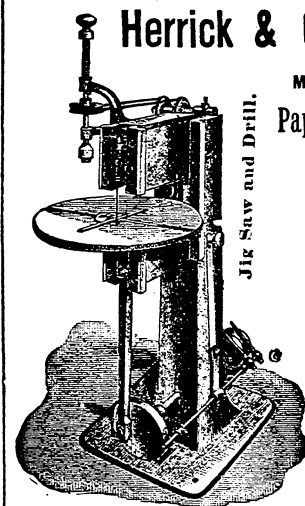
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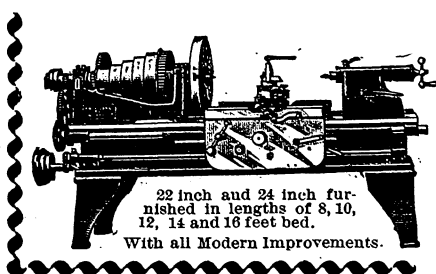
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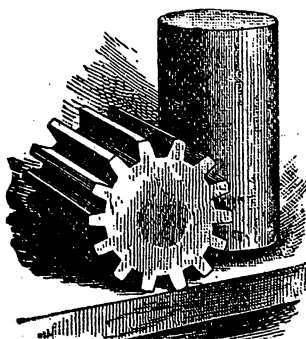
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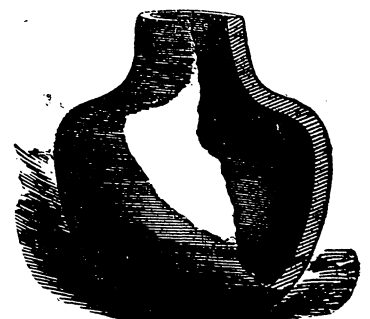
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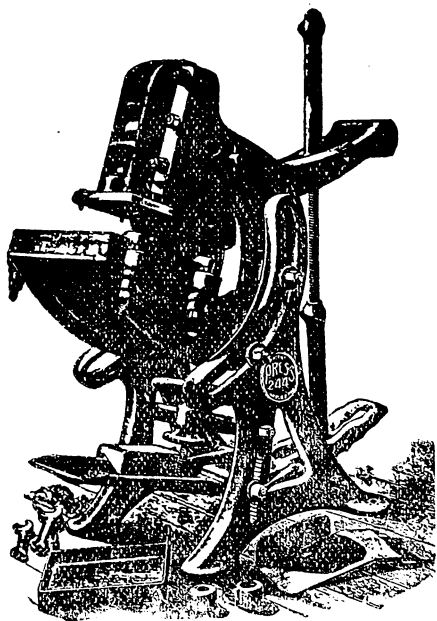
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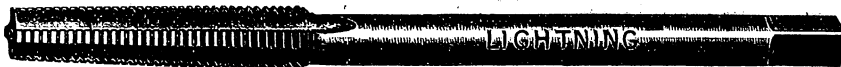
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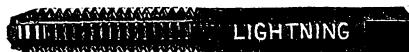
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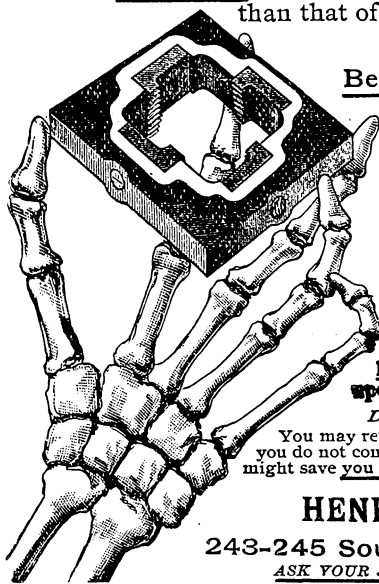
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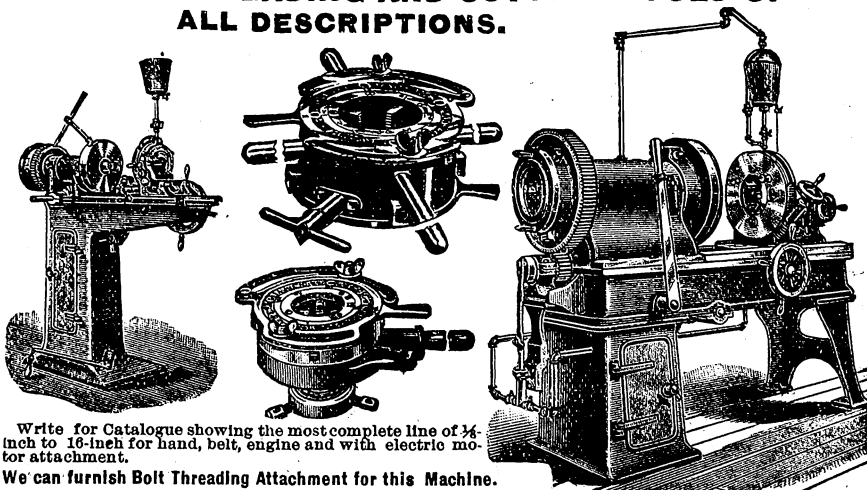
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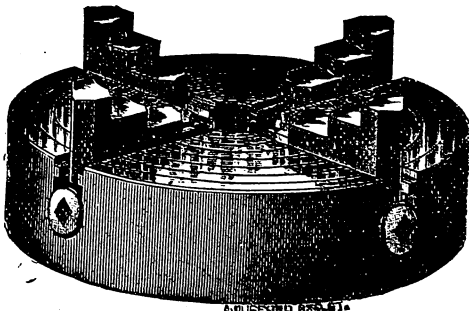
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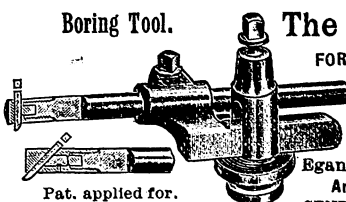
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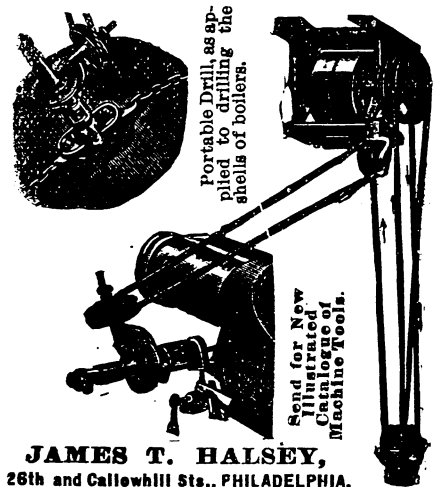
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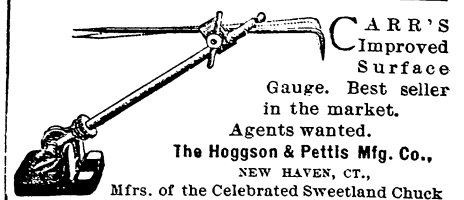
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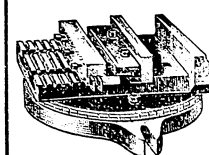
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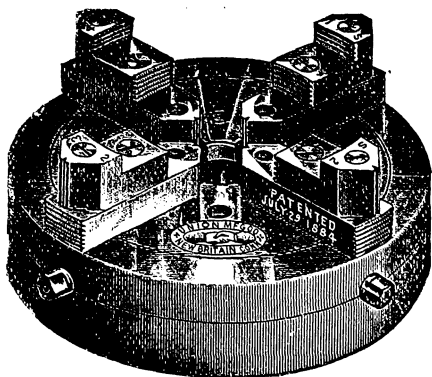
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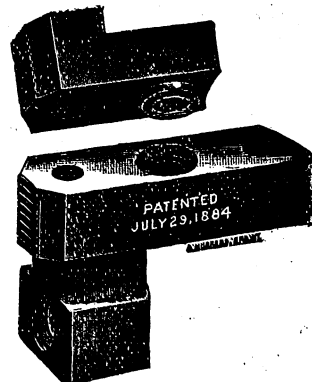
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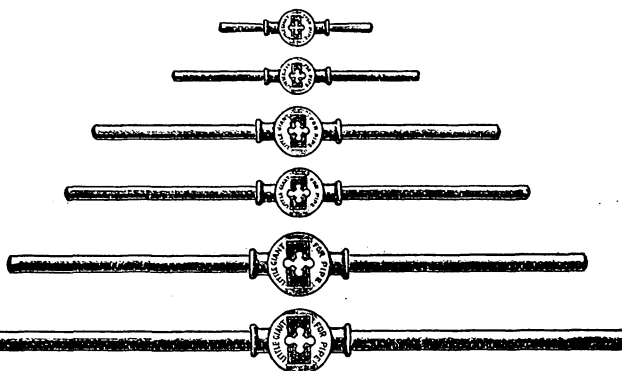
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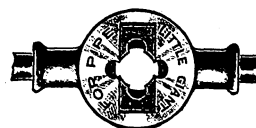
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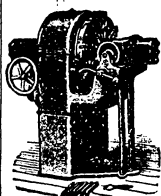
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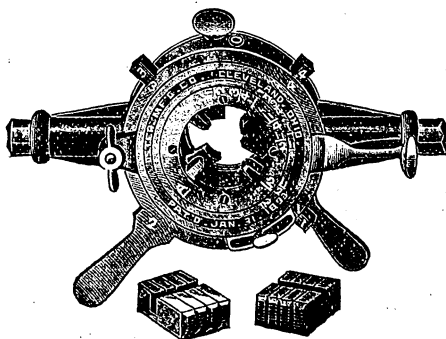
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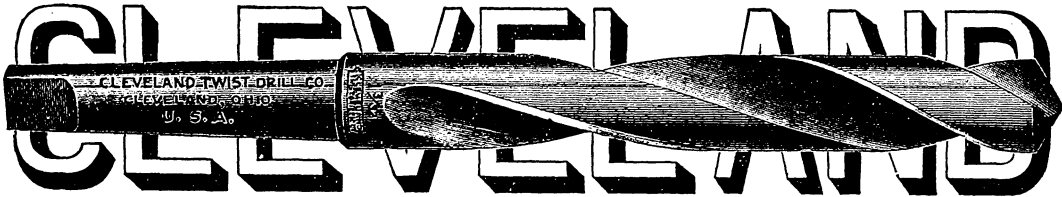
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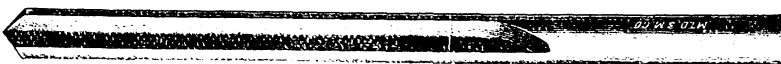
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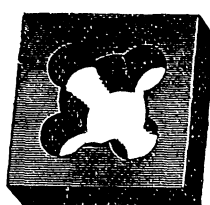
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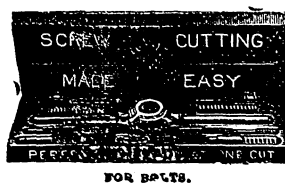


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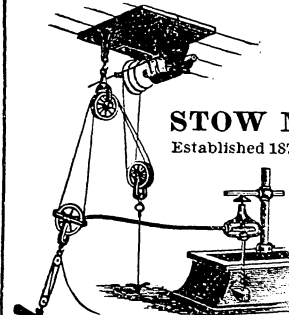


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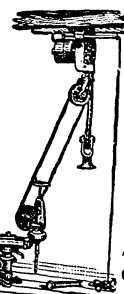
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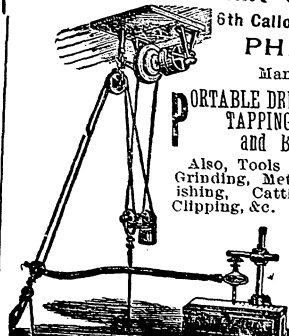
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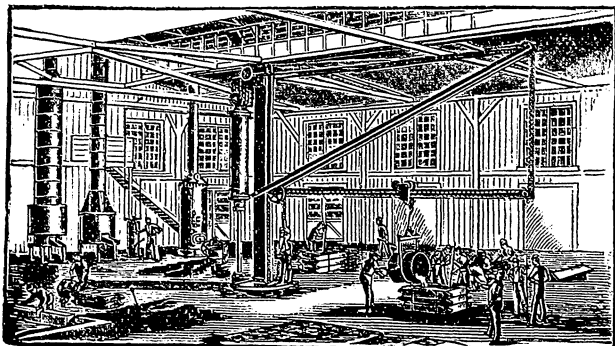
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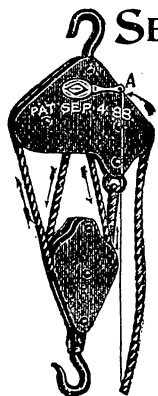
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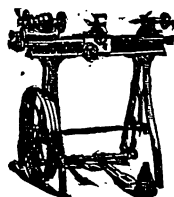
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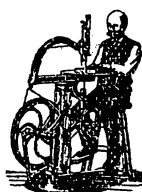
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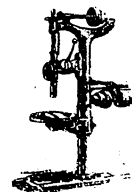
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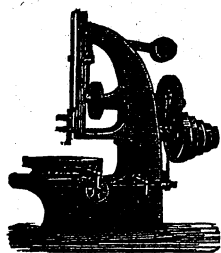


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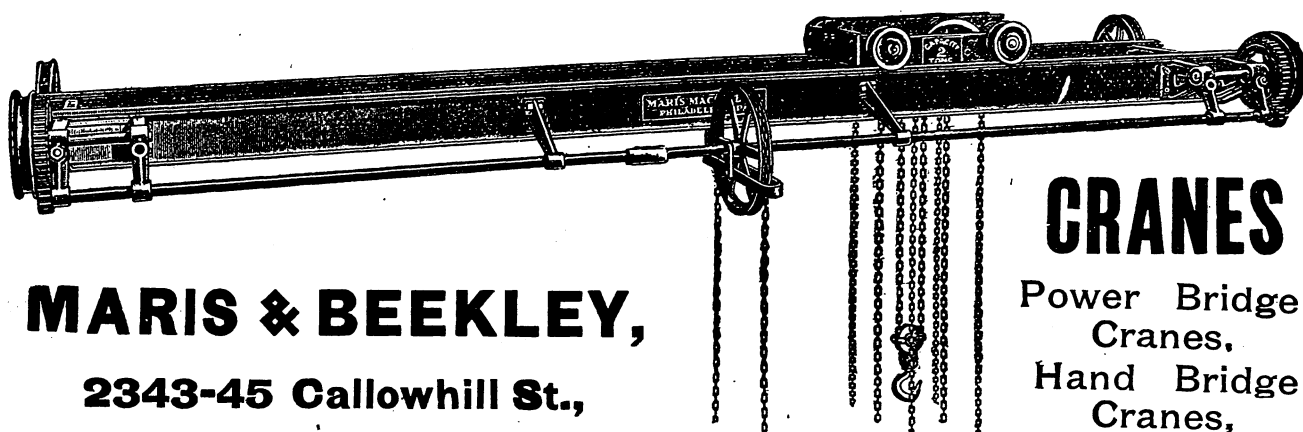
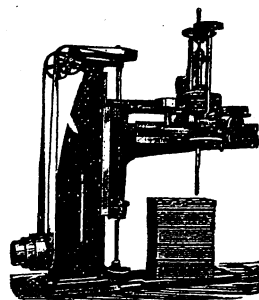


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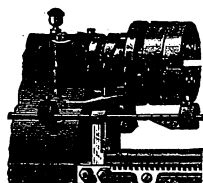
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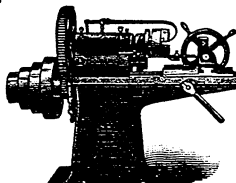
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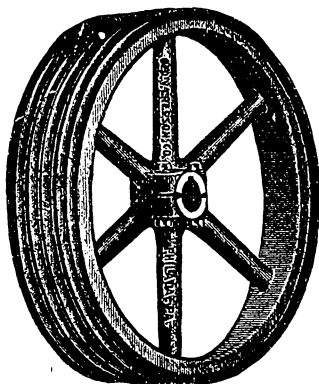
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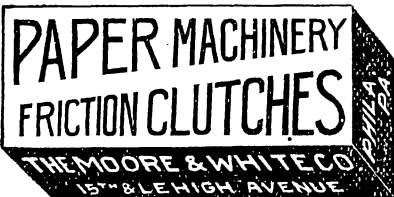
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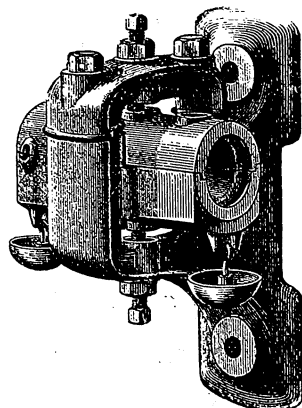
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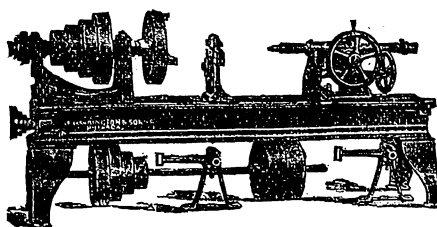
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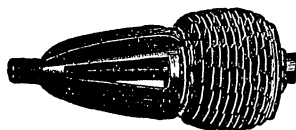


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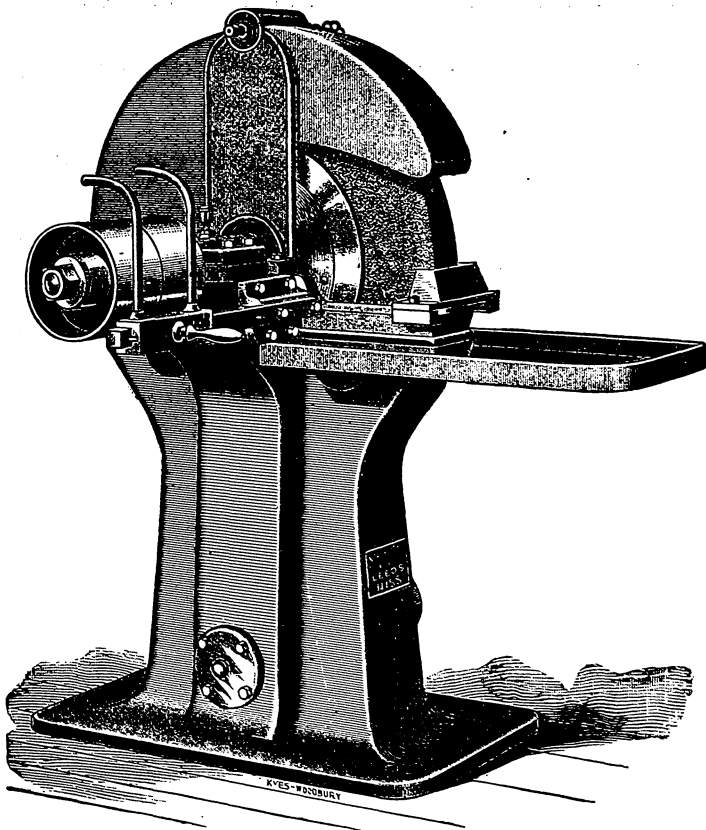


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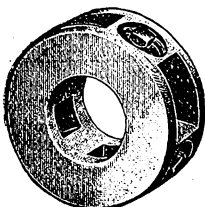
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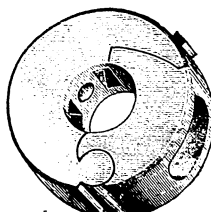


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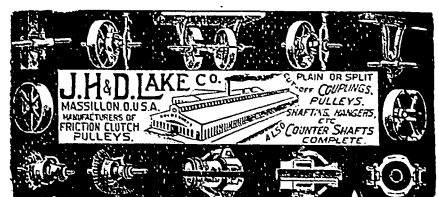
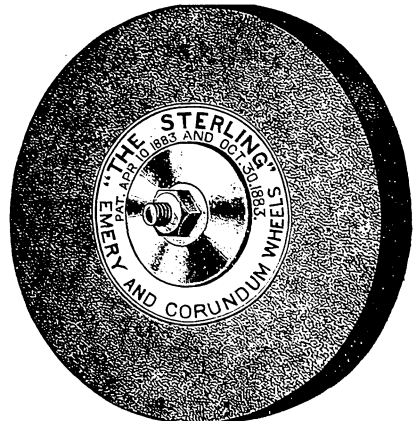
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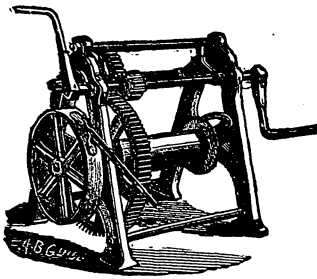
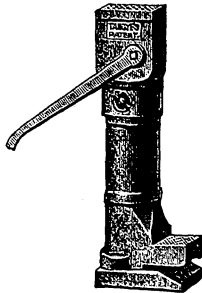
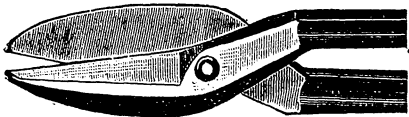
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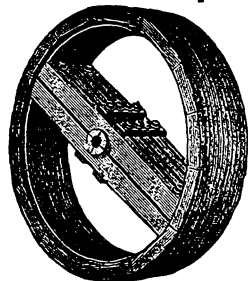


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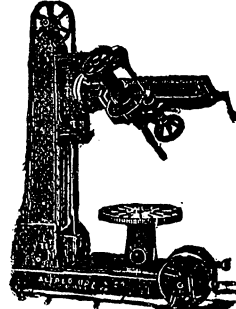
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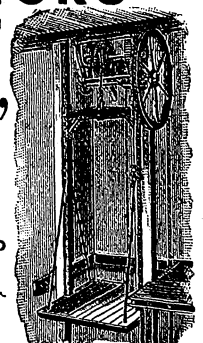
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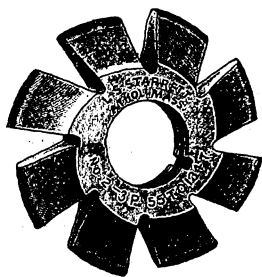
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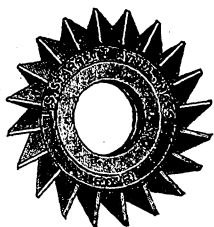
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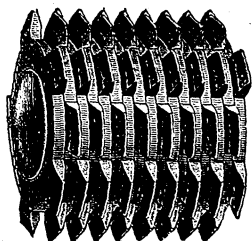
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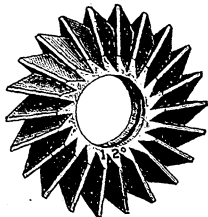
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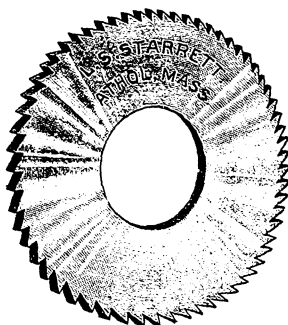
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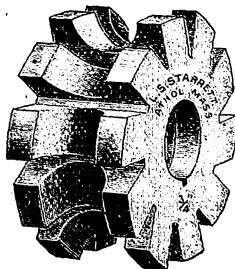
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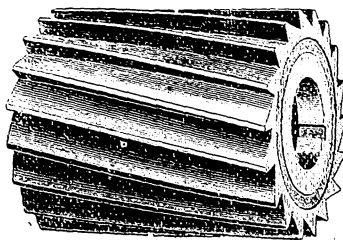
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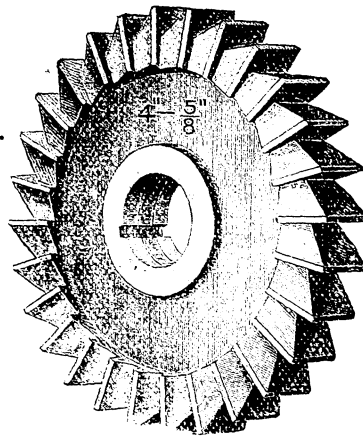
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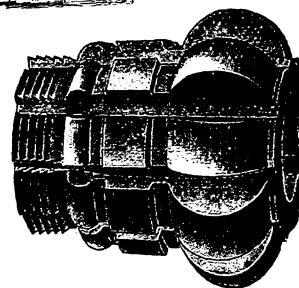
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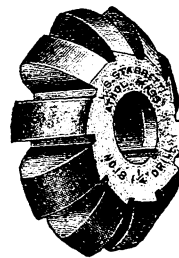
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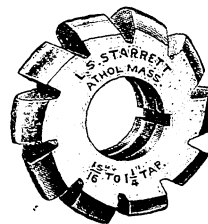
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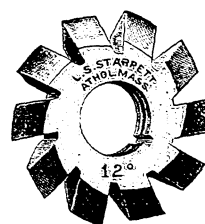
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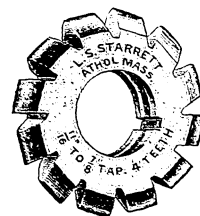
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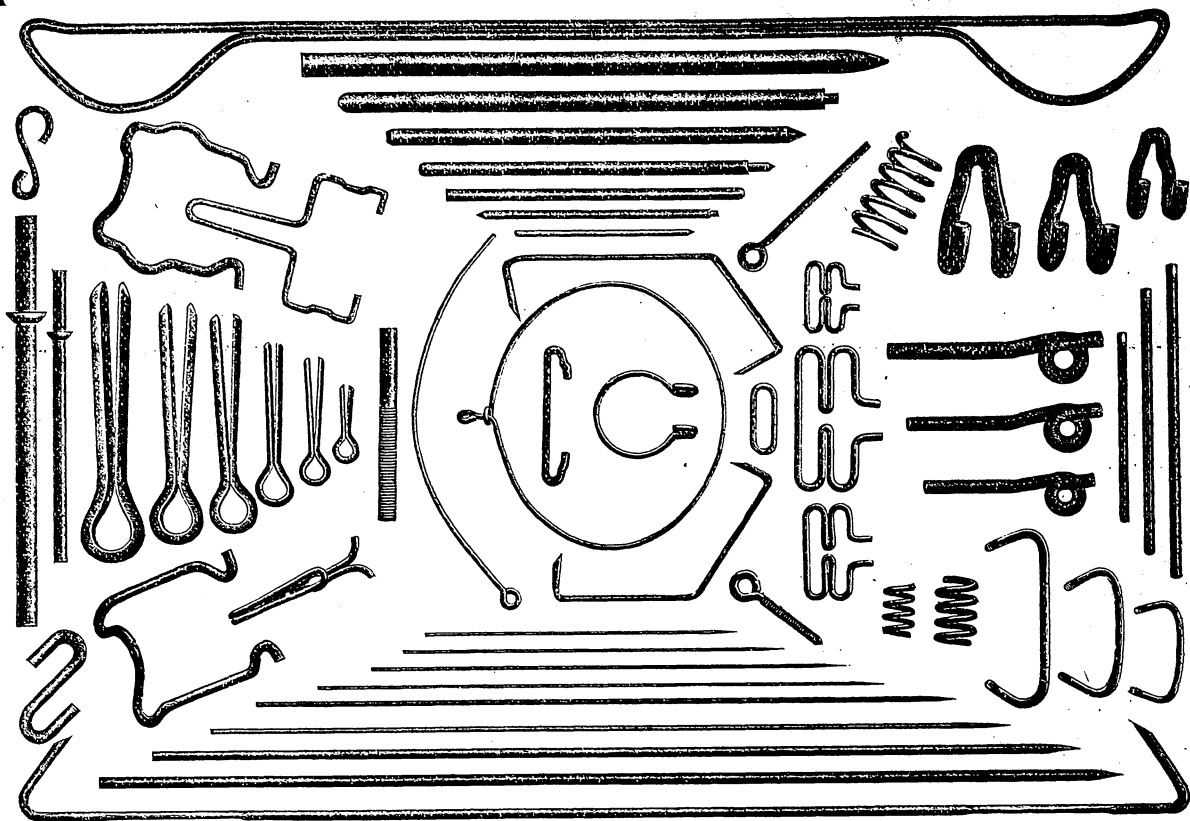
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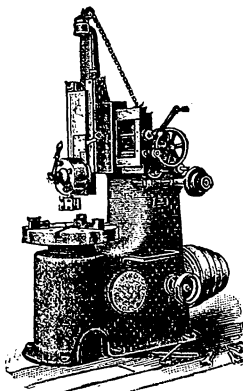
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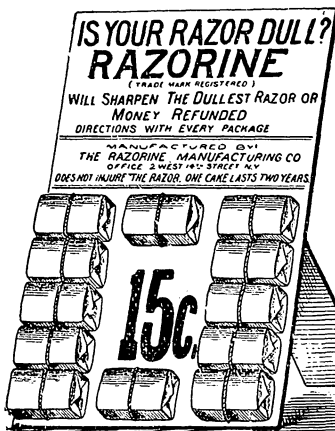
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  - 1 6 H.-P. Vertical Engine. Second-hand.
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  - 1 2 H.-P. Baxter Engine and Boiler. Second-hand.
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Good Second-hand Improved Ma-  
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Two small Planers, 30 in. x 30 in. x 6 ft.  
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One large Engine Lathe, 36 in. x 17½ ft.  
One large Engine Lathe, 36 in. x 12 ft.  
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These tools are of the most reputable build and most of them are practically new. Will sell at low prices.

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Also other machinery at low prices.

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Height, - 8 ft. 2 in.  
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OF DIFFERENT KINDS,

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Two 125 H.-P. Phoenix Automatic Compound Engines.  
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These at cut figures for the next 30 days.

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No.....	6	7	8	9	10	11
Pots.....	\$0.65	.75	.85	1.00	1.25	1.75
Kettles.....	.55	.65	.70	.85	1.00	1.40
T Kettles.....	.75	.80	.90	1.00	1.25	....
Spiders.....	.27	.30	.35	.40	.50	.60
Griddles Round	.22	.25	.27	.30	....	....
" Long..	.40	.50	.60	.75	....	....
SCOTCH AND YANKEE BOWLS.						
No.....	1	2	3	4	5	6
Scotch Bowls..	\$0.35	.40	.45	.50	.60	.70
Yankee Bowls.	.35	.45	.55	.65	.75	.90

## Glue Pots.

No.	4/0....	\$4.50	No. 2	.....	\$8.40
3/0....	5.00		3	.....	10.26
2/0....	5.50		4	.....	12.42
0....	6.00		5	.....	14.58
1....	6.75		6	.....	16.94

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Will run your Sewing Machine, Fans and other Light Machinery.

A Week's Work Done in a Day  
No Plumbing Required.

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CHAS. E. PARKHURST, 70 Walnut St.

SOMERVILLE, MASS., Nov. 21, 1893.

NOBLESVILLE, IND., Jan. 29, 1894.  
THE BOLGIANO MFG. CO., Baltimore, Md.  
Gentlemen:—The "Little Giant" Water Motor came to hand in due time, and works the sewing machine like a charm.  
Yours very truly,  
NOBLESVILLE MILLING CO.

**No. 2, \$10** Fans, Ice Cream Freezers, Lathes, Scroll Saws, Church Organs, etc.

COLORADO SPRINGS, COLORADO.

THE BOLGIANO MFG. CO., Baltimore, Md.  
Gentlemen:—We received the "Little Giant" Motor No. 2 on April 28, and have tested it in every possible way, and find that it works perfectly. At present it is running an eight and twelve old style Gordon press, and takes it at a very fast rate. We are more than pleased with it, and we will recommend it to everybody as a safe investment for their money.  
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WOODS BROS.

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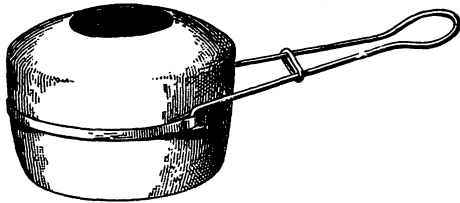


Fig. 108.—Clamp for Holding Tea Kettle while Being Tinned.

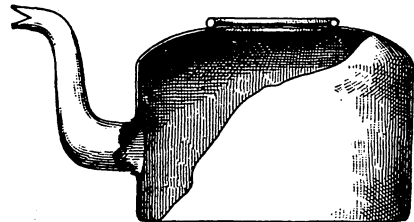


Fig. 110.—Tea-Kettle. Showing Spout Attached.

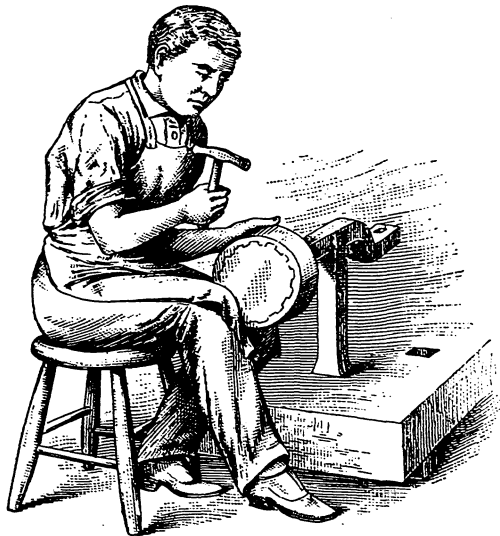


Fig. 107.—Planishing Tea-Kettle Side.

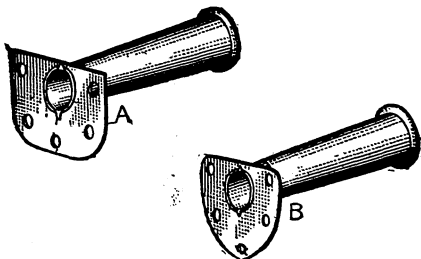


Fig. 54.—Way to Put the Flaps On.

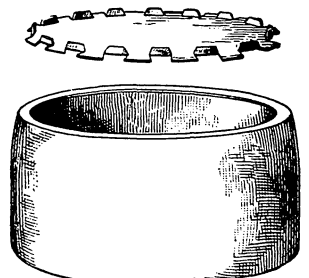


Fig. 105.—Putting in Bottom.

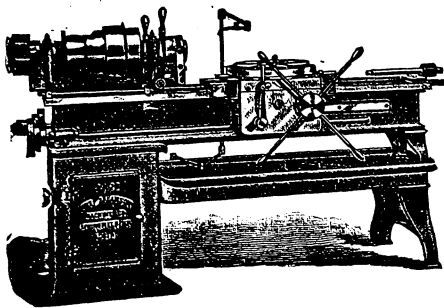
The above are Specimen Illustrations from "The Art of Coppersmithing," and indicate the Practical Nature of the Treatise, and how it Goes into All the Details of Workmanship.

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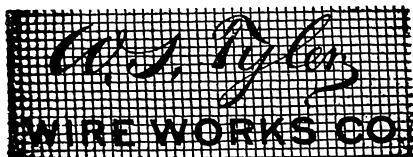


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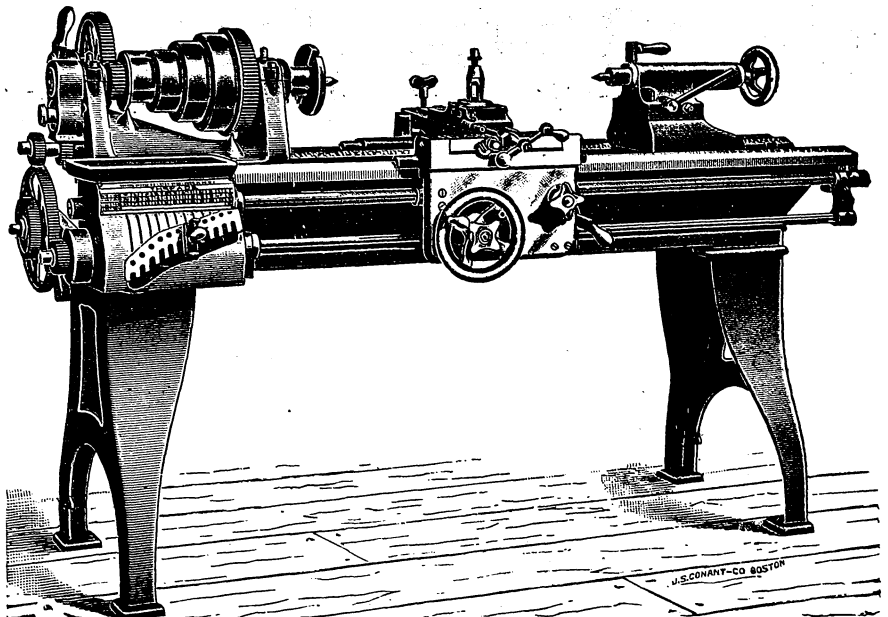
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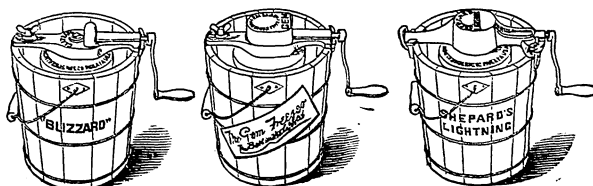
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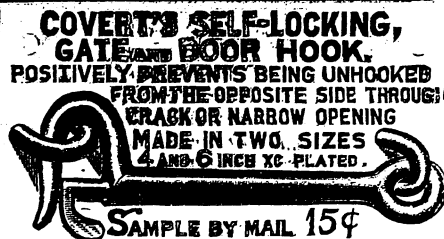
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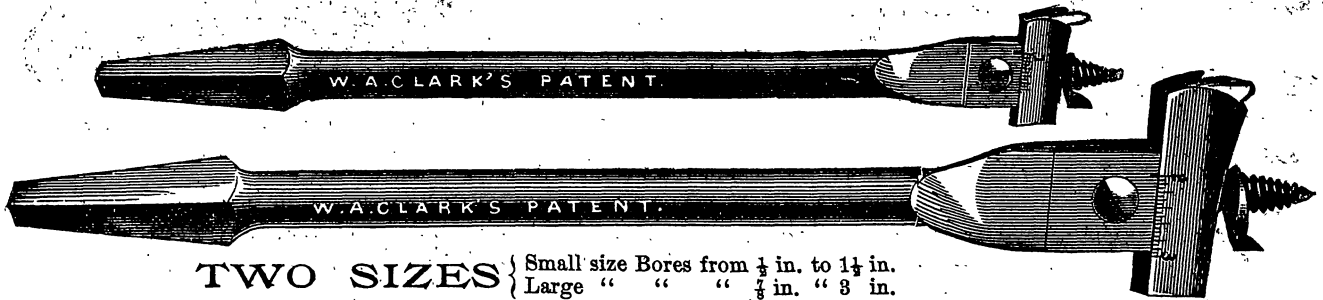
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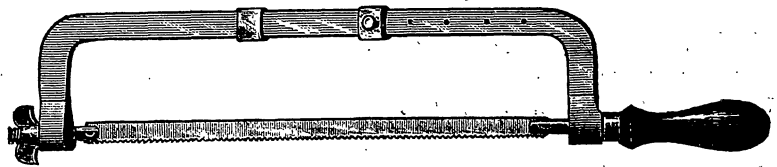


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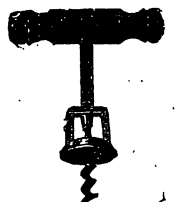
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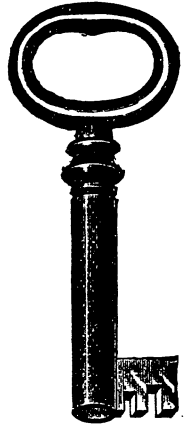
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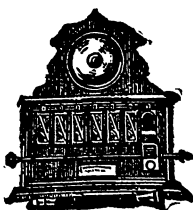
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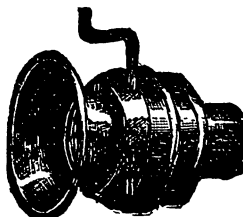
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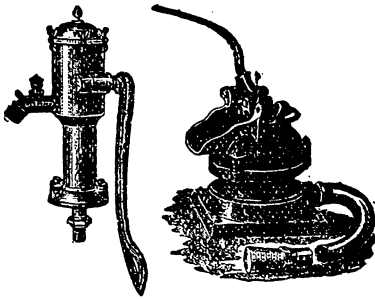
A LARGE CAPACITY AND EASY WORKING PUMP FOR

Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries;

Fig. 209.

Fig. 381.

Fig. 145.



or wherever it is desired to raise a large quantity of water by  
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The pump has large valves (accessible by hand), and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

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from 3,000 to 4,500 gallons per hour.

These pumps are simple, durable and low priced.

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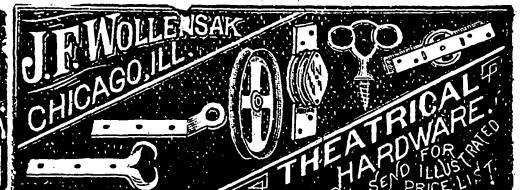
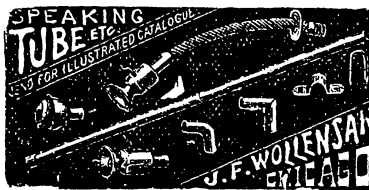
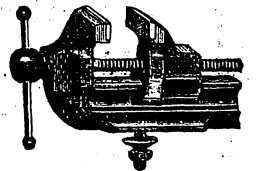
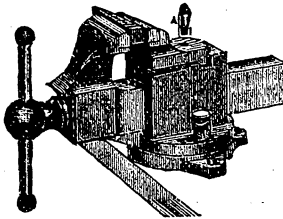
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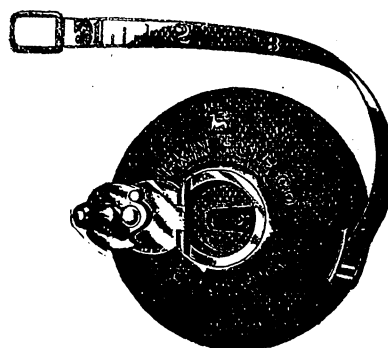


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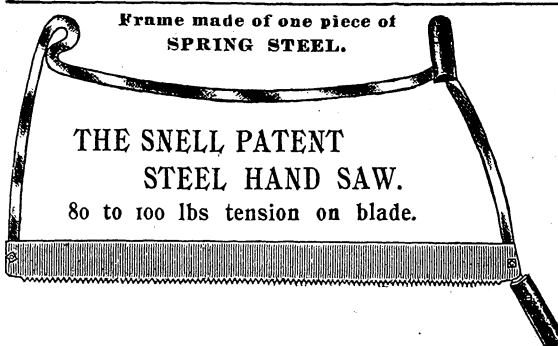
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Made specially to be sold by Hardware Stores.  
Thousands in use. Catalogues on application.  
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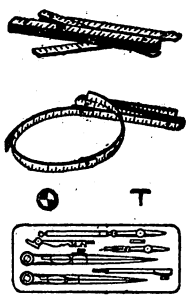
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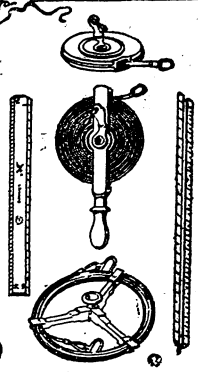
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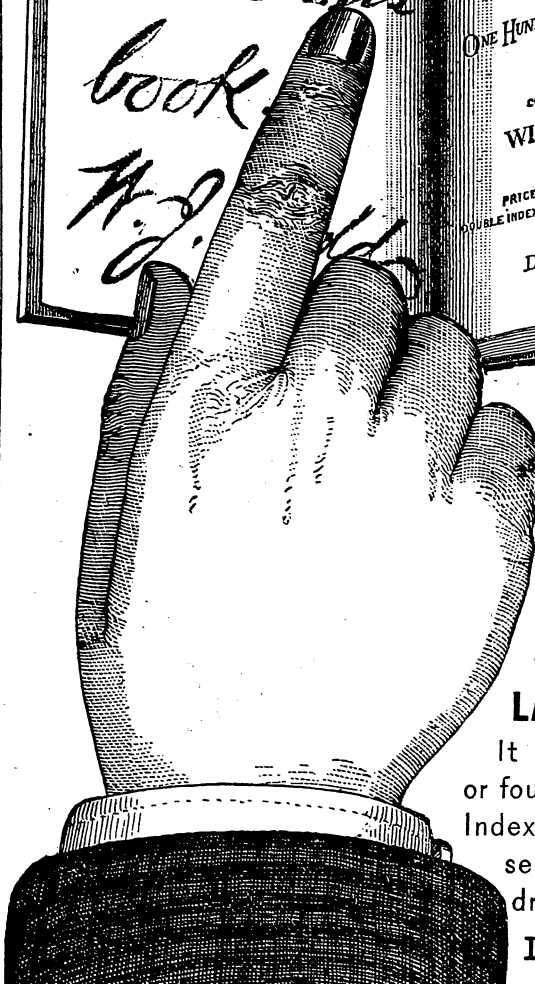
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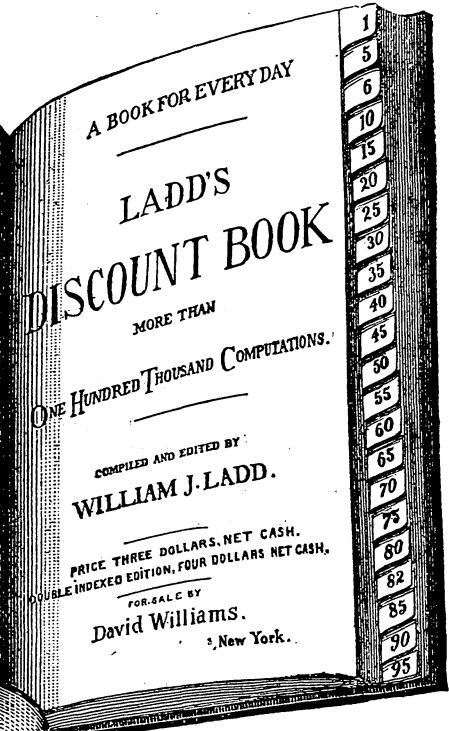
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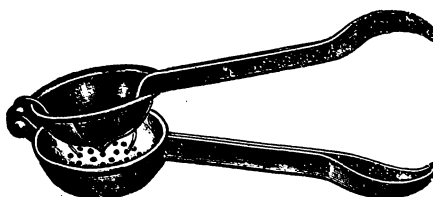
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## WENTWORTH'S PATENT NOISELESS SAW VISES,

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Prevent all vibration and render Saw Filing noiseless.  
Will make no more noise than Filing on a Solid Piece of Iron.

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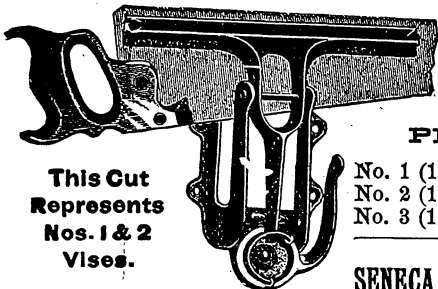
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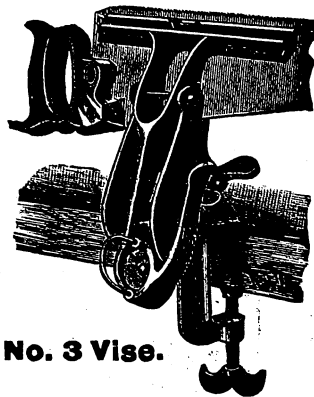
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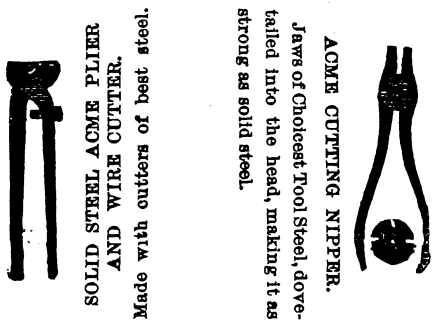
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Made with cutters of best steel.

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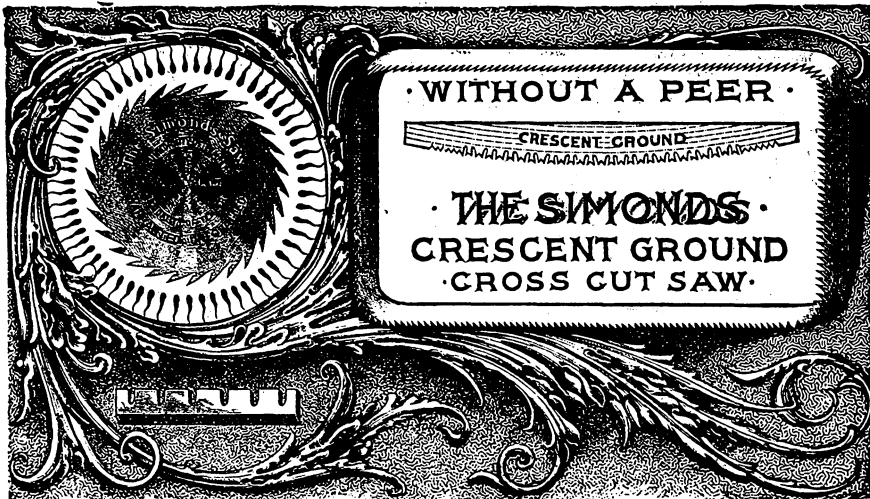
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Mechanics are now inquiring for this tool, and Hardware Dealers  
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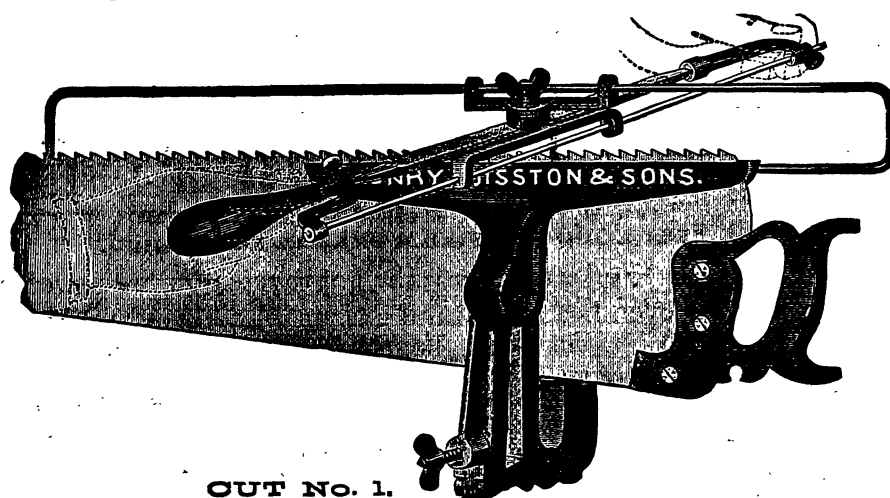
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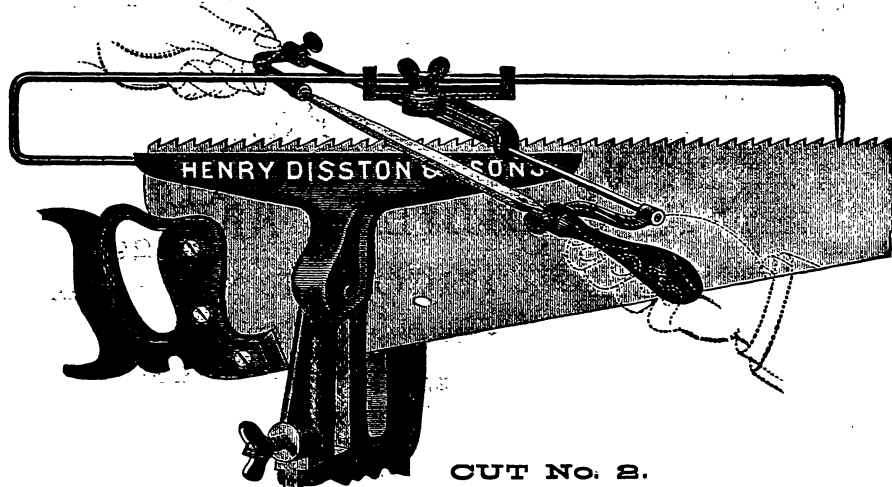
# DISSTON'S Improved Saw Clamp AND FILING GUIDE.

ESPECIALLY DESIGNED TO ASSIST THOSE NOT SKILLED IN THE ART  
OF SAW FILING TO FILE A SAW CORRECTLY.



CUT No. 1.

Cut No. 1 shows a saw and the attachment in proper position for filing the first side; and Cut No. 2 shows the saw and attachment reversed and in position to file the second side. There are three marks on one of the hubs of the swivel attachment, and one mark on the other. One of the three marks shows when it is in position No. 1, and the other designates when it is in position as shown in No. 2. The third, or centre, marks show when it is in position for filing Rip Saws.



CUT No. 2.

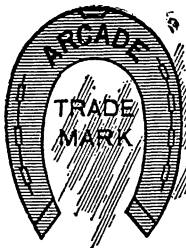
To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.

A good way is to select a tooth of correct shape and let file down into it, tighten set screw in handle, then file a tooth to see if the shape suits. If not turn the file a little to the right or left and try another tooth until the proper shape is obtained. Then file every other tooth, see cut No. 1; when one side is filed, reverse saw and attachment and adjust as in No. 2, and file the other teeth. For Rip Saws, place the file at right angles with the saw and file every tooth. Always keep the file as nearly horizontal as possible.

This filing guide is sold only attached to our No. 3 Improved Clamp or Vise, and not sold separately. We recommend this as the best saw clamp on the market, being quickly and easily adjusted, and not liable to get out of order.

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## THE FILES THAT LEAD THEM ALL

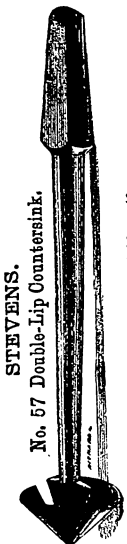
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The fact that the Arcade File Works alone use the improved File Machinery recently invented by Alfred Weed, and the even heat of natural gas, enables them to produce files that cut faster and wear longer than any on the market.

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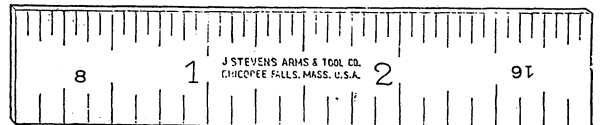
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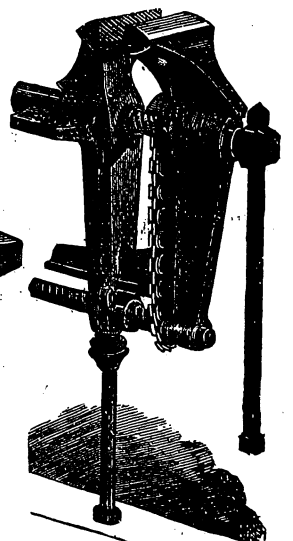
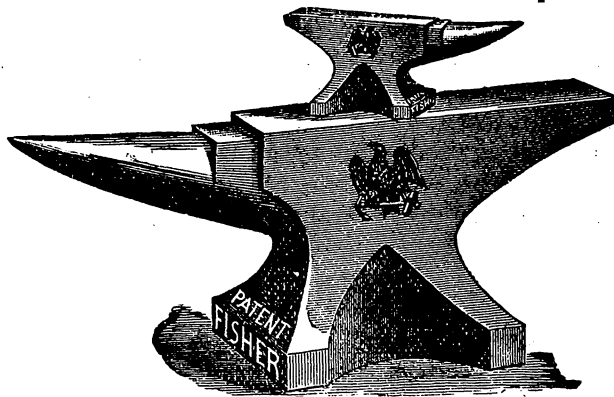
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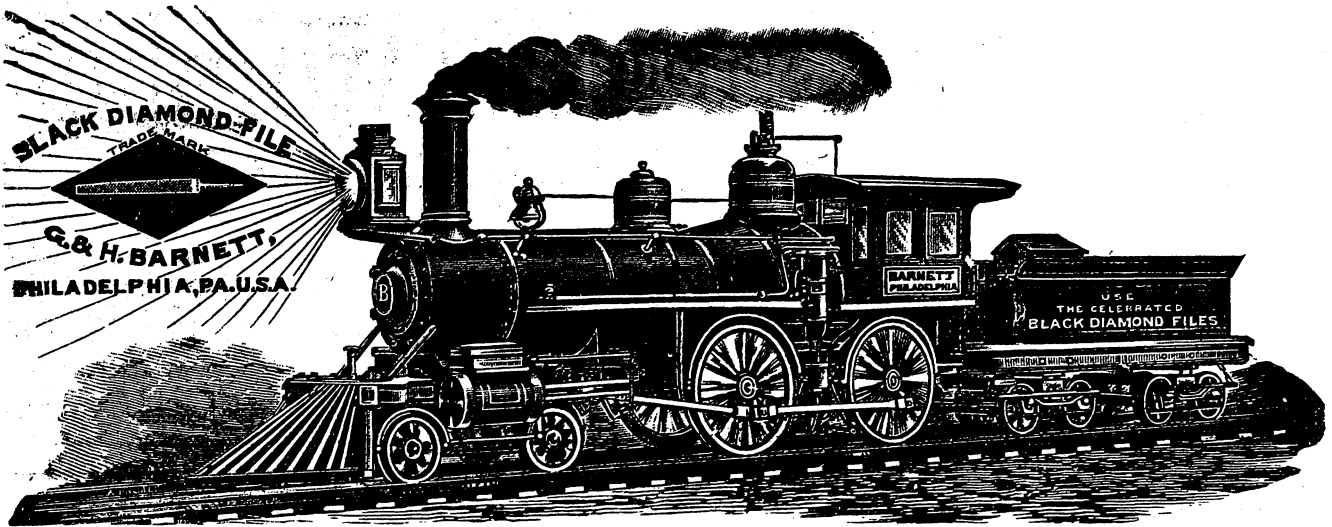
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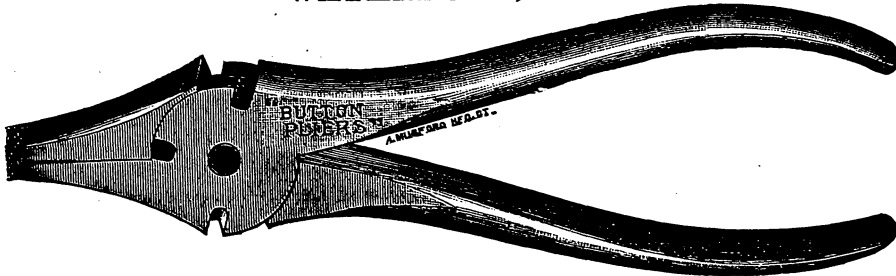
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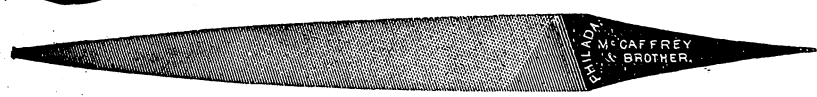
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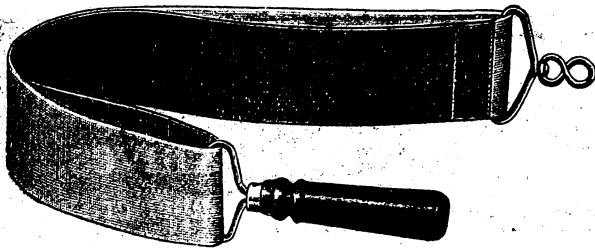
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We have no contract with Messrs. Hermann Boker & Co. as Agents for the sale of our goods.

HIGHEST AWARD PARIS EXPOSITION, 1889.

ESTABLISHED 1837.  
INCORPORATED 1892.



**THE L. & I. J. WHITE CO.,**

BUFFALO, N. Y.

MANUFACTURERS  
OF

**EDGE TOOLS.**

Coopers', Carpenters' and Ship Tools, Plane Irons,  
Cleavers, &c. Full Line Chisels.

1853

1894

Highest Awards at the World's Exposition for Superior Tools.



**CHARLES BUCK,**

sole surviving member of the original firm of BUCK BROS., and proprietor of the  
**MILLBURY EDGE TOOL WORKS, MILLBURY, MASS.,**

Manufacturer of the

**GENUINE STANDARD BUCK TOOLS**

All kinds of Shank, Socket Firmer Chisels and Gouges, Cut and Double Irons, S. D. Bits, etc. Send for Catalogue. CAUTION.—Buyers wanting the standard Buck Tools will see that they get only those stamped CHARLES BUCK when ordering from the jobbing houses. Address all correspondence to CHARLES BUCK or the

Millbury Edge Tool Works, Millbury, Mass.

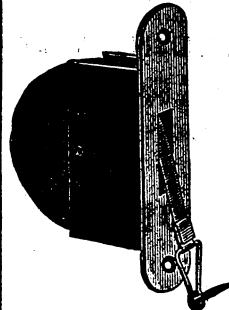
## Cast Shears.

**ACME SHEAR CO.,**

**BRIDGEPORT, - CONN.**

## PULLMAN Steel Frame Sash Balance.

Oldest and largest producers of a perfect working Spring Sash Balance in the world. Every Balance warranted. Re-



quire no box frames. Our prices lowest, our Balance the best. For sale by all leading Hardware dealers in the United States.

Write for Prices.

**PULLMAN SASH BALANCE CO., Rochester, N. Y.**

New York Office, 142 Chambers St.  
Chicago Office, 235 Lake St.

IF YOU WANT THE BEST  
FOR CATALOGUE & PRICES  
THEIR MAKE IS EQUAL  
IF NOT SUPERIOR  
TO ANY OTHER  
HAVE BEEN IN BUSINESS SINCE 1840.  
**BOARDMAN & SON**  
NICKEL SILVER SPOONS  
EAST HADDAM, CONN.

IF YOU WANT THE BEST  
FOR CATALOGUE & PRICES  
THEIR MAKE IS EQUAL  
IF NOT SUPERIOR  
TO ANY OTHER  
HAVE BEEN IN BUSINESS SINCE 1840.  
**BOARDMAN & SON**  
NICKEL SILVER SPOONS  
EAST HADDAM, CONN.

IF YOU WANT THE BEST  
FOR CATALOGUE & PRICES  
THEIR MAKE IS EQUAL  
IF NOT SUPERIOR  
TO ANY OTHER  
HAVE BEEN IN BUSINESS SINCE 1840.  
**BOARDMAN & SON**  
SILVER PLATED SPOONS  
EAST HADDAM, CONN.

## "Drive the Nails That Will Go"

and you feel sure they will hold. If you want to take them out then you must use

## The Nail Puller

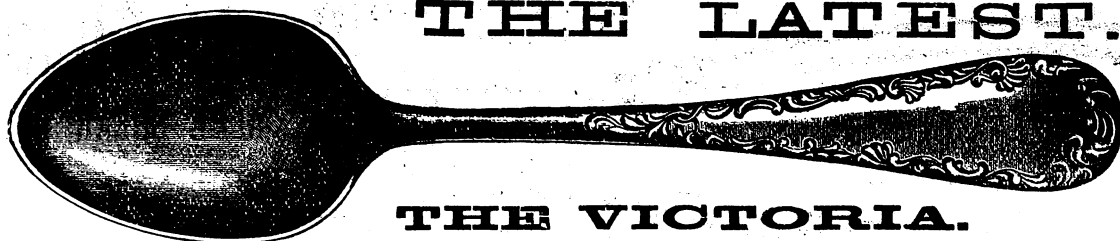
That Pulls,

and to be dead sure of it and have easy work pulling wire or cut nails, be sure that you have a

## Black Hawk

Nail Puller.

SPECIALTY MFG. CO.,  
HARTFORD, CONN.



We have a full line of above, which is the neatest pattern ever presented to the trade, and it is stamped



NONE GENUINE WITHOUT THIS TRADE-MARK.

**WM. ROGERS MFG. CO.,** Offices, Hartford, Conn.  
 FACTORIES HARTFORD, CONN., NORWICH, CONN., AND TAUNTON, MASS.

## Quality or Price?

Don't sacrifice quality for price. Don't pay too much for quality. You do neither by buying of us. The name of a reliable manufacturer on goods is worth more than it costs.



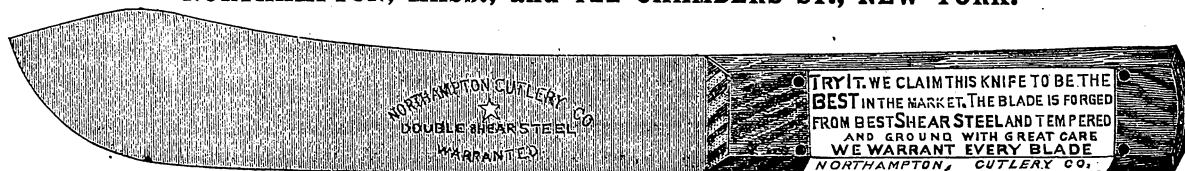
Send for folders.



**THE HOLMES & EDWARDS SILVER CO.,** - - Bridgeport, Conn.

## NORTHAMPTON CUTLERY CO.,

NORTHAMPTON, MASS., and 122 CHAMBERS ST., NEW YORK.



WE CALL ESPECIAL ATTENTION TO OUR COMPLETE LINE OF FINE GOODS IN RUBBER, CELLULOID, BONE, IVORY, &c.

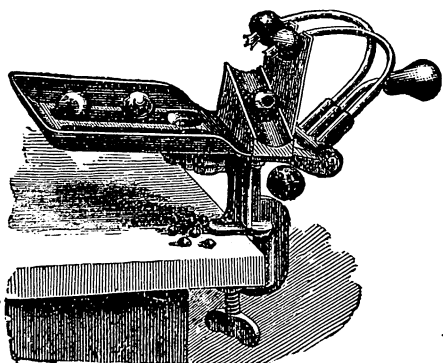
— OUR CLAIMS ARE: —

EXTRA QUALITY OF STEEL IN BLADES.

SUPERIORITY IN GRINDING AND FINISH.

STRENGTH AND DURABILITY

Made in Plain Steel or Heavily Plated Blades, Hand Burnished.



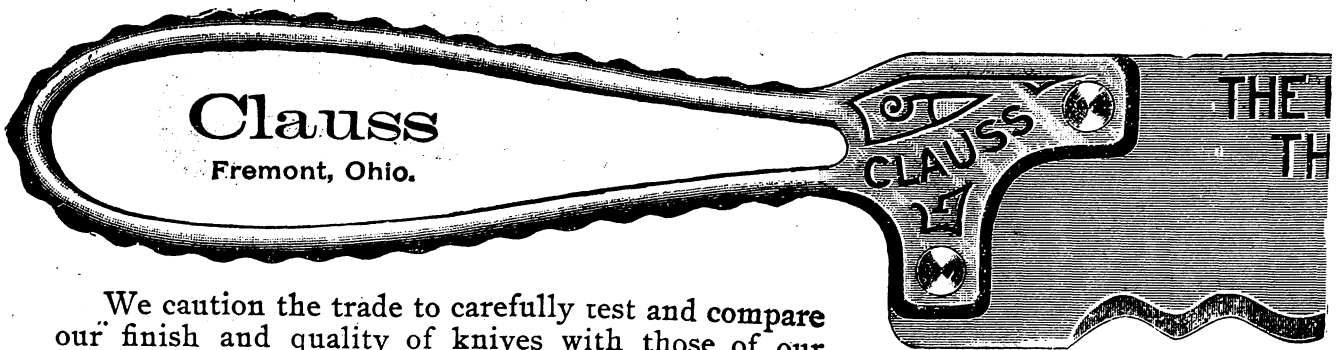
## The Family Cherry Stoner

MADE BY

**GOODSELL COMPANY,**

Antrim, N. H.,

Received highest award at World's Columbian Exposition. The only Cherry Stoner made that does not mash the fruit in removing the stone. No skill required to operate it. Cheaper and better than any other. Send in your orders early. Sold by hardware jobbers everywhere.

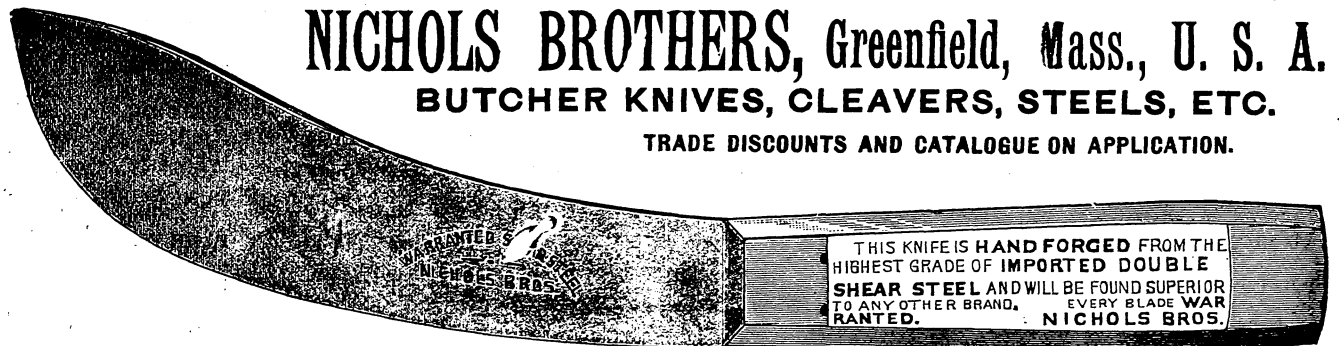


We caution the trade to carefully test and compare our finish and quality of knives with those of our competitors; we have no fear of the results as has always, so far, been in our favor.

We take this means of informing our customers that our knives are covered by patents of our own on ideas originally and entirely our own. Infringers will be prosecuted to the full extent of the law.

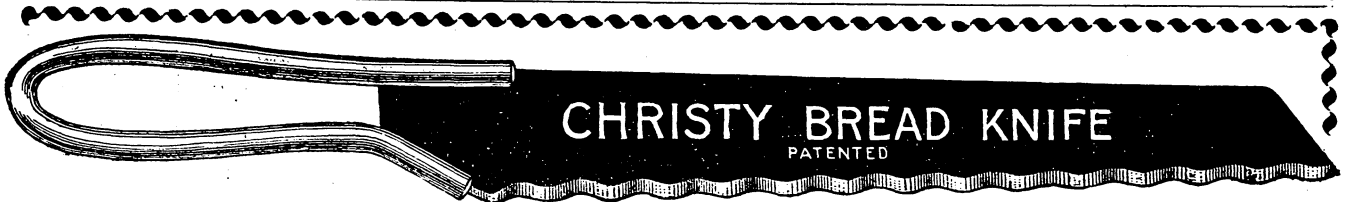
**THE CLAUSS SHEAR CO., Fremont, Ohio.**

NEW YORK OFFICE, 100 CHAMBERS STREET.



**NICHOLS BROTHERS, Greenfield, Mass., U. S. A.**  
**BUTCHER KNIVES, CLEAVERS, STEELS, ETC.**

TRADE DISCOUNTS AND CATALOGUE ON APPLICATION.



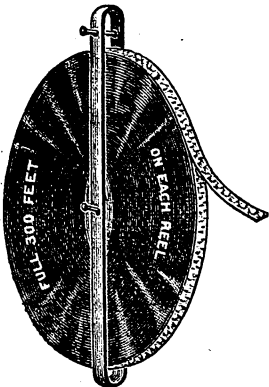
There are imitations and counterfeits with cast handles—cheap, but not good. Reputable dealers will not impose upon their patrons knowingly. Ask your wholesale dealer for prices. It pays to be posted on the "Christy."

**THE CHRISTY KNIFE CO., Makers,**  
**Fremont, O., U. S. A.**

New York Office, 64 Reade Street,  
 David Eastman, Manager.



A thin Metal Strap, through which a nail can be driven without punching.



Put up in 300-foot Reels and Bundles of 100 pairs each, from 4 to 12.

## TO USERS OF BOX STRAPS:

Certain competitors of ours have issued circulars pretending to have secured **injunctions against us on our Self-Drawing Wire Strap** (as shown in cut above), and on **Steel Straps on Reels** (see cut of Reel herewith). **Such statements are absolutely false.**

**We have not been enjoined**, either on our well-known Reels, or on the **Self-Drawing Wire Strap**, on which we own **the only patent in existence**. On the Reel, these parties asked injunction and **were refused by the Court**. On the Strap, **we sued them** for infringing our patent; they at once changed their goods by stamping out the stock, making them weak and valueless. We therefore dropped the suit, and formal order of dismissal was entered. This is all the basis there is for the talk of "final judgment on April 2d." Our customers may depend on absolute protection on our goods as above. Very respectfully,

**DE HAVEN MANUFACTURING CO., 50, 52 & 54 Columbia Heights, Brooklyn, N. Y.**

Brooklyn, May 18th, 1894.

Drills for Wood  
 & Metal, Counter-  
 sinks, Screw  
 Drivers, Chucks,  
 &c., for sale by  
 the trade.

**Syracuse Twist Drill Company,**  
**SYRACUSE, N. Y.**

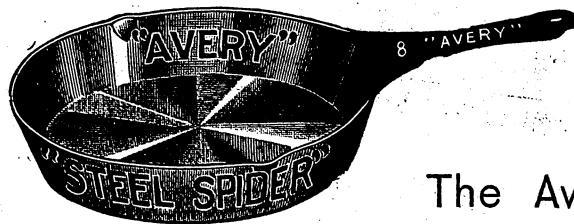


Every tool fully  
 Guaranteed.  
 Beware of im-  
 itations.



Steel  
Spiders,  
Griddles,  
Kettles,  
Maslins,  
Scotch Bowls,  
Stew Pots,  
Stew Pans,  
Etc.

We Do First Class Tinning.

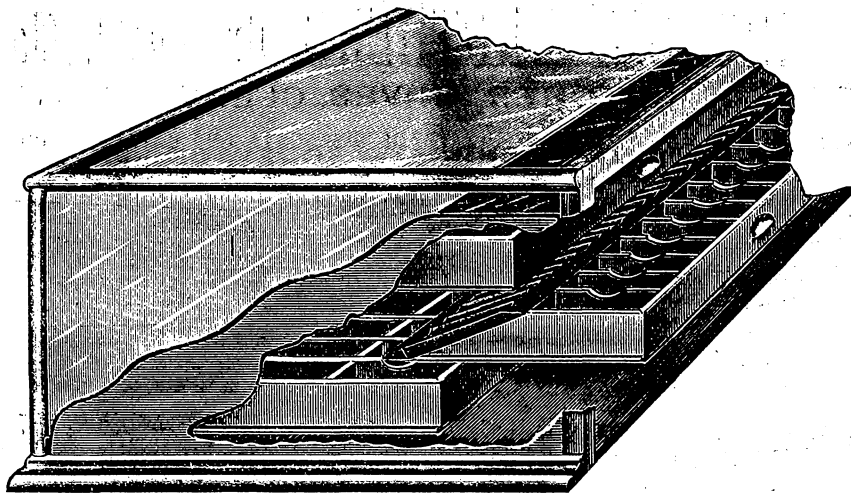


The Avery Stamping Co.,  
CLEVELAND, OHIO.

## The "Dempsey" Patent Cutlery Display Case.

PATENTED OCTOBER 3d, 1893.

Universally in-  
dorsed by the  
trade. It makes  
the best display.  
Increases sales  
Attracts atten-  
tion to particular  
patterns. Saves  
time. Econo-  
mizes space.  
Easier adjusted  
and superior in  
every respect to  
all others.



Sectional view of CASE showing Drawers in position to supply or obtain stock.—  
For other views of Case see advertisements in "The Iron Age," May 17, 24  
and 31 and illustrated description in this issue.

Marks every  
article without  
marring or soil-  
ing blades. Pre-  
vents rust. Saves  
money. Is the  
most convenient  
and practical  
manner of keep-  
ing stock ever  
devised. No  
rubber bands to  
lift up or soil the  
cutlery.

Impossible for stock to get in bad shape. Made in all lengths and any desired finish.

We solicit inquiry from home and foreign trade.

**THE UNION SHOW CASE COMPANY, CHICAGO, ILLINOIS, U. S. A.,**  
**SOLE MANUFACTURERS.**

The Following Leading Firms are our Duly Authorized Agents:

Dame, Stoddard, Kendall & Co., Boston, Mass.  
F. A. Koch & Co., New York, N. Y.  
Electric Cutlery Co., New York, N. Y.  
A. R. Justice & Co., Philadelphia, Pa.  
Henry Keidell & Co., Baltimore, Md.  
The Wm. Bingham Co., Cleveland, Ohio.

Speer Hardware Co., Fort Smith, Ark.  
Dixon, Bergeson & Co., Portland, Oregon.  
Baker & Hamilton Hardware Co., San Francisco, Cal.  
Kirkpatrick Hardware Co., Atlanta, Ga.  
W. C. Belknap & Co., Louisville, Ky.  
A. P. Shapleigh Hdw. Co., St. Louis, Mo.  
The Wyeth Hardware & Mfg. Co., St. Joseph, Mo.

Rogers & Baldwin Hdw. Co., Springfield, Mo.  
McGregor-Noe Hdw. Co., Springfield, Mo.  
Wells & Nellegar Co., Chicago, Ill.  
Henry Sears & Co., Chicago, Ill.  
Joseph Fritziatt Hdw. Co., Milwaukee, Wis.  
Farwell, Ozmun, Kirk & Co., St. Paul, Minn.



This is a fac-simile of the label on my VULCAN TOOL CO. brand of HATCHETS; a brand for which I have a regular trade in some sections, but to those who have not "caught on"—dealers who are handling an outside brand—I offer a limited quantity at a very low price. Inquiries for price solicited.

FAYETTE R. PLUMB, Philadelphia.

THE WILLIAMS PRINTING CO.,

Commercial Printers and Binders

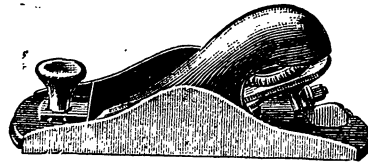
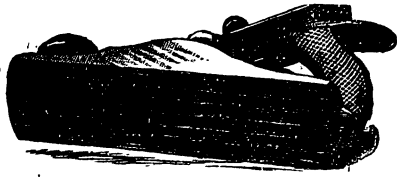
ESTIMATES FURNISHED FOR ALL CLASSES OF WORK.

96, 98, 100 & 102 READE ST.,

NEW YORK.

# CARPENTERS' AND MACHINISTS' TOOLS.

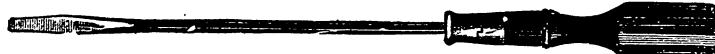
Chaplin's Pat.  
Iron Planes,  
Corrugated  
Bottoms,  
Checkered  
Rubber Handles.



Chaplin's Block  
Planes, Solid  
and Adjustable  
Throats.  
Nickel and  
Japan Finish.

## TOWER'S CHAMPION SCREW DRIVERS.

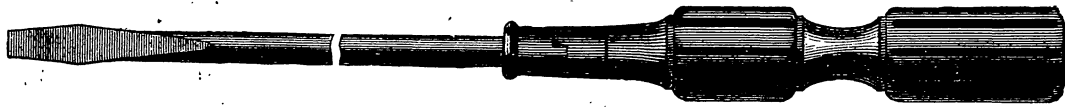
The Fluted  
Handle Gives  
the Best  
Possible Grip.



CHAMPION CABINET SCREW DRIVER.



CHAMPION SCREW DRIVER.

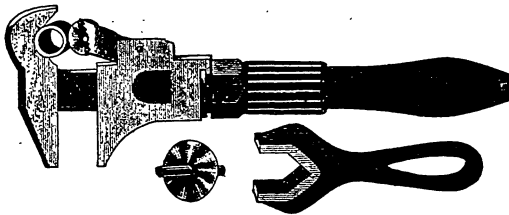


CHAMPION MACHINISTS' SCREW DRIVERS.

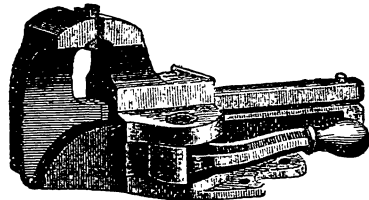
Forged Blades,  
Solid Bolsters.

Cannot Turn  
in the Handles.

ENGINEERS'  
WRENCHES,  
SHORT AND  
LONG NUTS  
AND WITH  
PIPE  
CUTTERS.



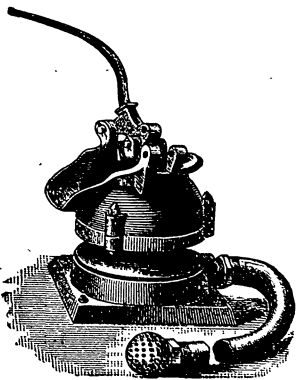
STEPHEN  
VISES,  
STATIONERY  
AND  
SWIVEL  
BASES.



ALSO PLUMB  
BOBS,  
TRAMMEL  
POINTS,  
LEVELS  
OILERS  
WRENCHES, &c

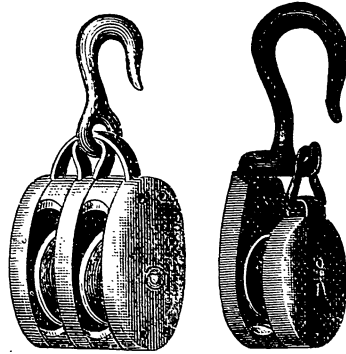
TOWER & LYON, Manufacturers, - - 95 Chambers St., New York.

## TACKLE BLOCKS, GUN IMPLEMENTS, DOG COLLARS, ICE AND ROLLER SKATES, MALLETS, ETC.

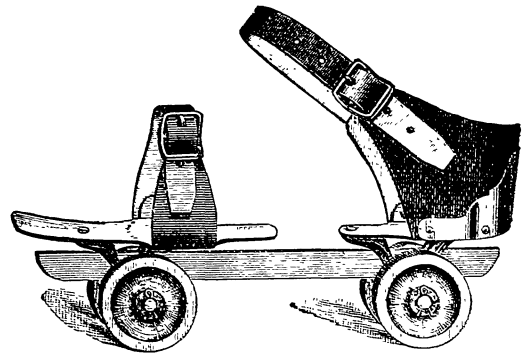


Loud's Patent

SUCTION PUMPS. TACKLE BLOCKS.

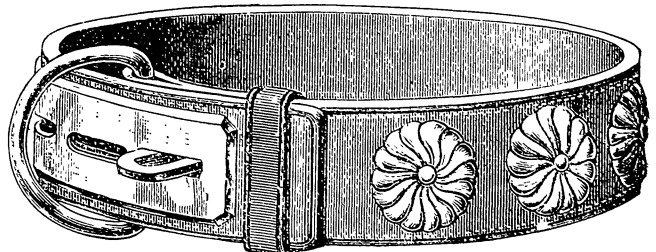
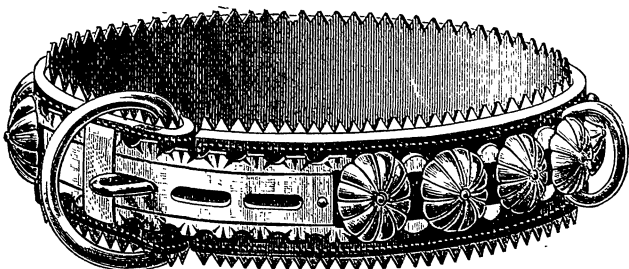


Union Brand



Side-Walk and Rink  
ROLLER SKATES.

A Full Line of Dog Collars, Muzzles, Leads, Etc.



UNION HARDWARE CO., - TORRINGTON, CONN.

New York Office, TOWER & LYON, 95 Chambers St., New York.



## The Great Copper Trusts are Broken.

The *exorbitant* and *ruinous figure* to which copper had been driven by the trust caused us to cease manufacturing the **Adjustable Soldering Copper Irons** for the time being.

The demand for the goods from old customers, and the many orders we were thus unable to fill, is good evidence that it is the *only Soldering Iron* that meets the demands of the *Tinsmith* and *Plumber*.

With new and improved machinery we are once more in a position to receive and fill orders with the

### Best Soldering Iron in the Market.

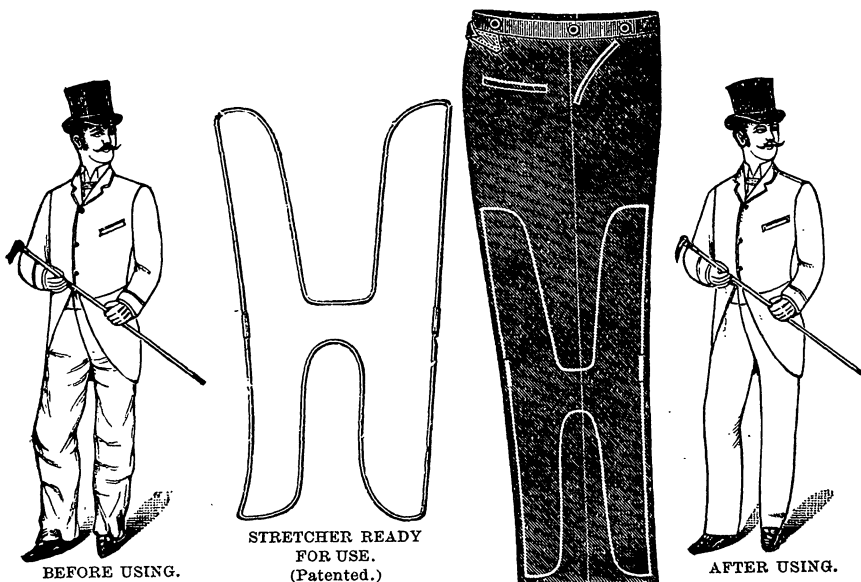
It is a complete tool in every respect, and can be as easily adjusted at any angle while hot as cold. The handle can be used indefinitely, as when the copper is worn out it can be *replaced* in the *same handle*, making the Iron as good as new and at about *half the cost* of the ordinary soldering iron. These *Soldering Irons*, like our other goods, are guaranteed *first-class* in every respect.

☞ A sample of  $\frac{3}{8}$  inch soldering iron will be sent by mail, free of postage to any address, on receipt of sixty cents (60c.).

FOR SALE BY ALL GENERAL HARDWARE AND PLUMBERS' SUPPLY HOUSES AT MANUFACTURERS' PRICES.

COVERT MFG. CO., WEST TROY, N. Y.

## Covert Pants Stretcher



GENTLEMEN using the Covert "Pants Stretcher" will find that their pantaloons will be restored to their original shape and length.

It removes all **WRINKLES** and **BAGGING AT THE KNEES**, and gives them the appearance of having just left the tailor's hands.

It is also very useful for holding the pants in a convenient position for brushing and cleaning.

The invention is simplicity itself, and cannot get out of order, and can be adjusted in the pants in a few seconds.

It adapts itself to the gradual yielding of the fabric, and cannot injure the garment.

Being applied inside the pants, it obviates all objections prominent in other stretchers.

It is made of steel wire, light and compact, and being in sections can be *packed in a valise when traveling*. Sold by the trade, or

Sample pair sent by mail to any address, free of postage, on receipt of \$1.00.

MANUFACTURED ONLY BY

COVERT MFG. CO., WEST TROY, N. Y.

# THE AMERICAN AXE AND TOOL CO.,

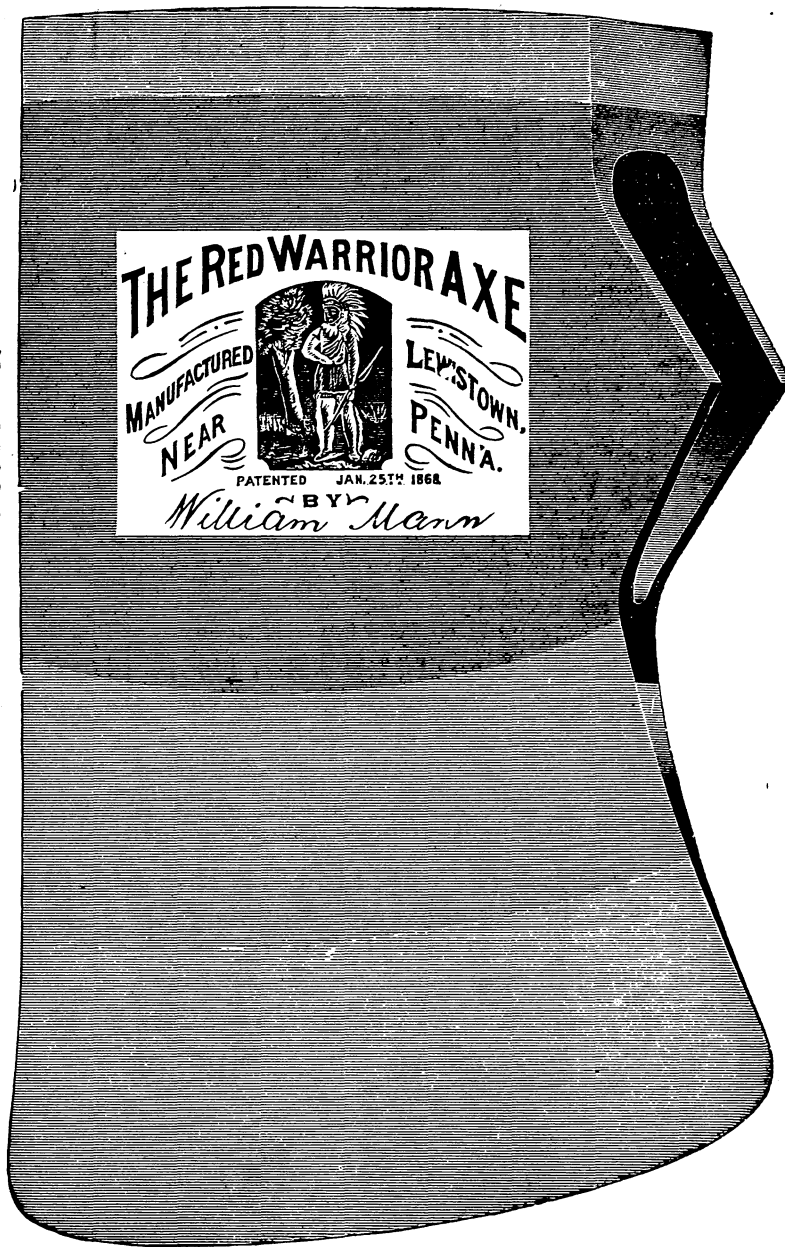
253 Broadway, - - - NEW YORK.  
**TELEPHONE, 1023 CORTLANDT.**

Manufacturers of

BLOOD, HUNT, LIPPINCOTT, RED WARRIOR, MANN, HURD, PEERLESS, JAMESTOWN,  
 ROMER, FRANCIS, SHARPS, UNDERHILL, STEWART,

Brands of

AXES, HATCHETS, BROAD AXES and ADZES, also "Blood's" Champion and  
 "Hubbard's" Diamond Blade SCYTHES.



Grass Hooks, Corn Knives, Bush Hooks, Planters' Eye Hoes, Ice Axes, Ice Hatchets and  
 Firemen's Axes, Wood Chisels, Picks, Mattocks, Brick Hammers, Box Openers, Ice Chisels, Butchers'  
 Handled Axes, Meat Hatchets.

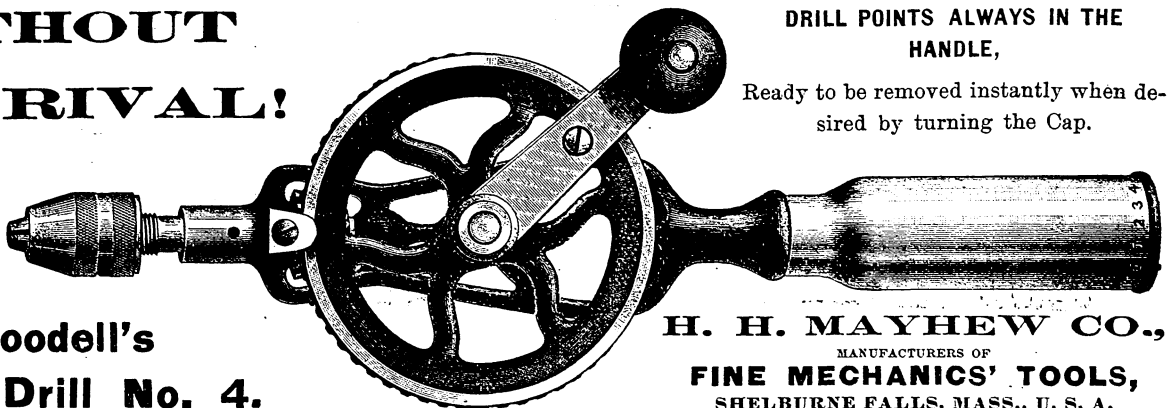
**ALWAYS IN STOCK:** Best Leading Brands of Axes and Edge Tools. Cheap Handled  
 Axes, Medium Grade Axes. Boys' and Hunters' Axes. **Job Lots of Axes, all Grades  
 and Patterns.**

ADDRESS ALL CORRESPONDENCE TO NEW YORK OFFICE.

## WITHOUT A RIVAL!

A MODEL  
**CHUCK.**

Holds any Twist  
 Drill from 5-32  
 down to No. 80.

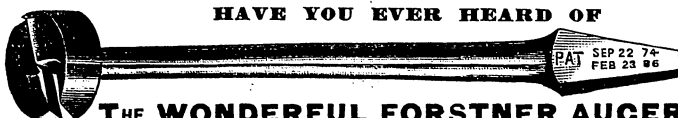


**Goodell's  
 Hand Drill No. 4.**

DRILL POINTS ALWAYS IN THE  
 HANDLE,

Ready to be removed instantly when de-  
 sired by turning the Cap.

**H. H. MAYHEW CO.,**  
 MANUFACTURERS OF  
**FINE MECHANICS' TOOLS,**  
 SHELBURNE FALLS, MASS., U. S. A.



HAVE YOU EVER HEARD OF

**THE WONDERFUL FORSTNER AUGER BIT ?**

If not, it will pay you to send for a sample 4-8 bit and price-list. Sent on receipt of 55 cents. It will bore  
 Round, Oval and Square Holes, and cannot be equalled for fine carpentry, cabinet or pattern work. Discount  
 to dealers on application.

Depot for Sales.

FOR SALE BY ALL HARDWARE DEALERS  
**THE BRIDGEPORT GUN IMPLEMENT CO.,**

313 and 315 Broadway, New York.

The Iron Age Standard Hardware Lists For  
 Use in Price Books. Compiled by R. R. WIL-  
 LIAMS, Hardware Editor of *The Iron Age*. These  
 lists are supplied in pamphlet form and are in-  
 tended to be cut out and inserted in *The Iron Age*  
 Hardware Price Books. For this purpose they are  
 printed on thin and tough paper of the best quality,  
 and prepared with a special view to compactness  
 and convenience of reference. Some of the lists  
 are printed in more than one arrangement, per-  
 mitting a choice of the best adapted.

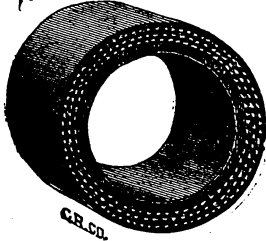
For sale by David Williams 96-102 Reade St., N. Y.



**The  
Piqua Handle  
& M'f'g Co.,  
Piqua, - Ohio.**

MAKERS OF  
Farm'g Tool Handl's.  
Garden Rakes, "Piqua"  
Natural Wood Lock Fur-  
niture, Base Knobs, Elec-  
tric Push Buttons and  
Kindred Goods.  
Write for prices & cat.

NEW SEAMLESS TUBE



SALES OF  
Over Two Million Feet

OF GARDEN HOSE

alone during the past year,  
distributed throughout  
the United States, and not a  
single piece complained of,  
justifies us in guaran-  
teeing that it will give absolute  
satisfaction.

## Who Has Not Had Bad Hose ?

Who has not lost time, patience, money, by attempting settlement for such goods ?

THE CAUSE in nine cases out of ten is the lapped seam.

THE REMEDY is in buying our

### PATENT SEAMLESS TUBE HOSE,

made by machinery, the tube run like lead pipe, through a die. There is no lapped tube, no seam, no cracks, no defects; water cannot get through to rot the duck and cause the hose to burst.

Made in All Sizes and Kinds of Garden, Engine, Steam, Fire, Brewers' Cotton Hose, &c.

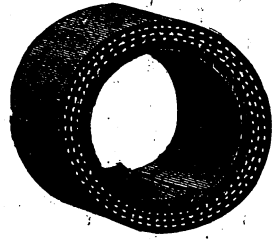
Order a Sample Bale of our Seamless-Tube Hose—Best in the World, costs no more than ordinary lapped-seam hose. The different colors, Red, White, Black, Green and Yellow, make a fine window or sidewalk attraction.

## CLEVELAND RUBBER WORKS

of the Mechanical Rubber Co.,  
CLEVELAND, O.

Makers of Mechanical Rubber Goods, Clothing, Druggists' Sundries, Specialties, Etc.

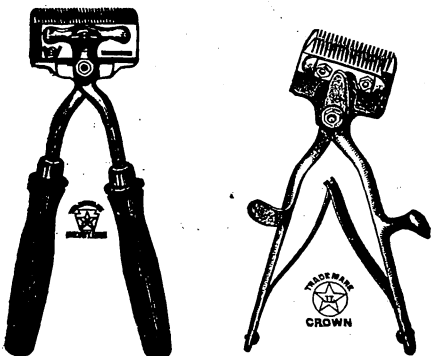
'OLD LAPPED TUBE'



We were awarded an order of  
25,000 ft. for World's Fair  
of our celebrated  
**Seamless-Tube**  
COTTON RUBBER-LINED HOSE

We Want Your Trade.  
Send for 60-page Catalogue.  
Write for Prices and Samples.

## IF YOU ARE INTERESTED IN CLIPPERS



For HORSEMEN OR BARBERS  
Send Postal Card for our new Illustrated  
Catalogue.

**JESSE LEE & SON,**  
37 SO. FOURTH ST., PHILADELPHIA.

## American Stamping Co.,

Manufacturers of

All Kinds of Tinware and Sheet  
Metal Goods.

N. Y. Office and Salesroom, 104 & 106 John St.  
Factory, 103 to 119 N. 3d St., Brooklyn, E. D., N. Y.

## Hudson's Garden Hose Mender.

So Simple a Child Can Use it.

Made in three sizes, for  $\frac{1}{2}$  in.,  $\frac{3}{4}$  in. and 1 in. hose.

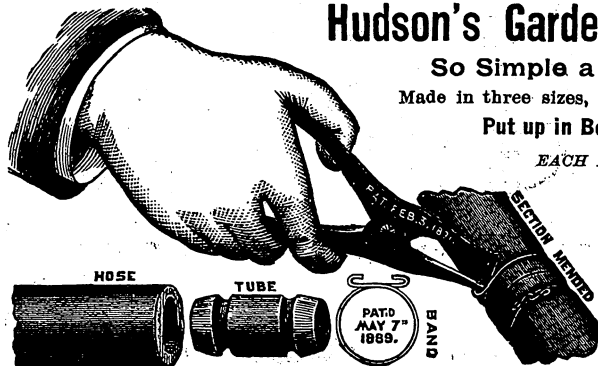
Put up in Boxes for Family use.

EACH BOX CONTAINS:

1 Pair Pliers,  
20 Bands,  
6 Tubes.

Sells readily at 75 cents.  
Liberal discount to Dealers.

Send for Full Description.



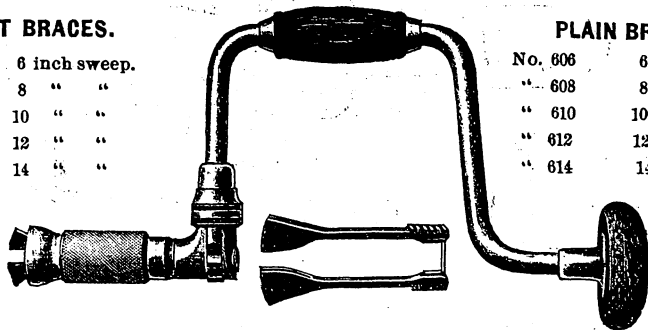
**C. E. HUDSON & CO.,** Manufacturers, Leominster, Mass.

### RATCHET BRACES.

No. 66	6 inch sweep.
" 86	8 " "
" 106	10 " "
" 126	12 " "
" 146	14 " "

### PLAIN BRACES.

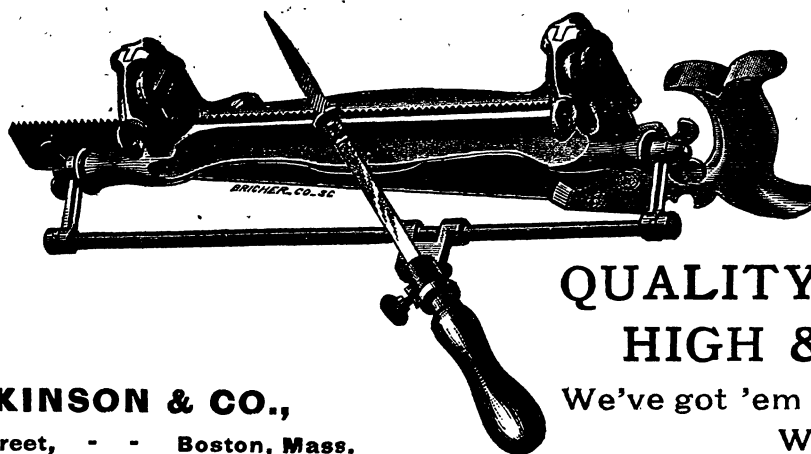
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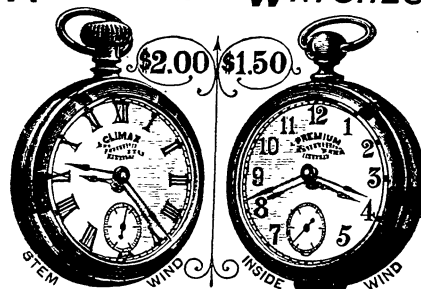
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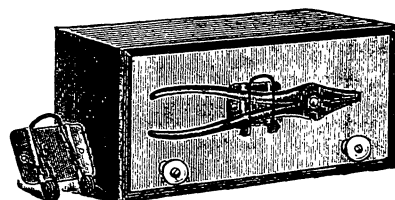
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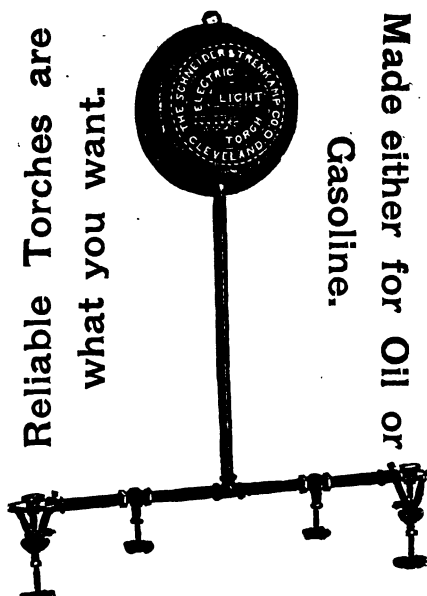
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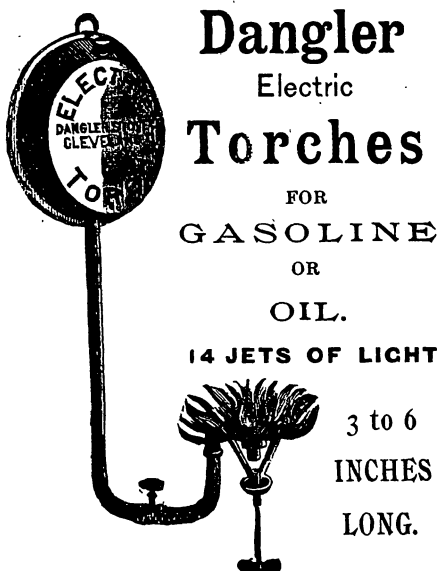
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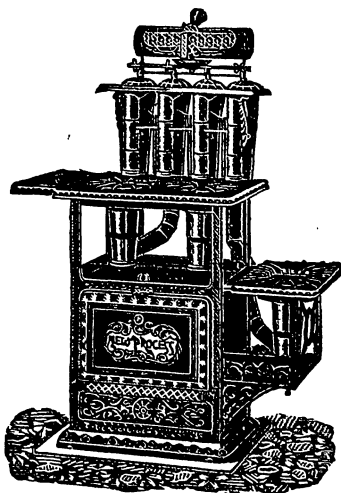
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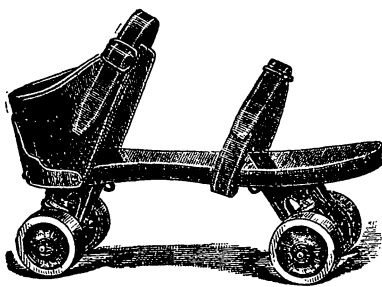
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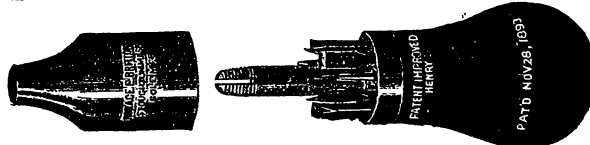
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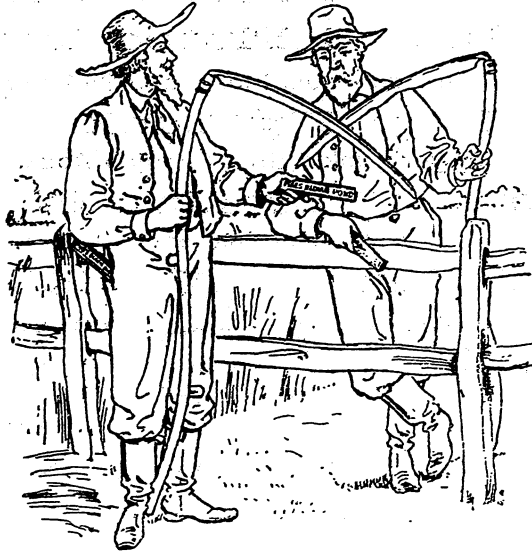


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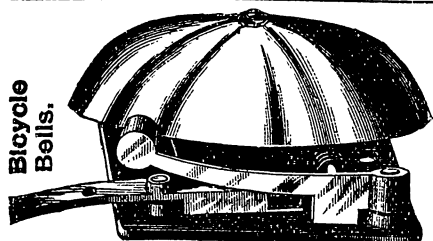
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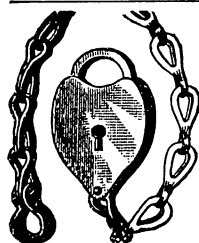
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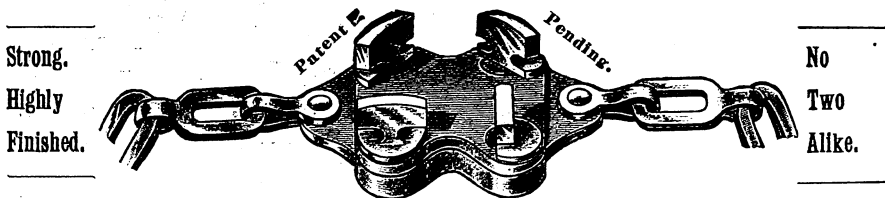
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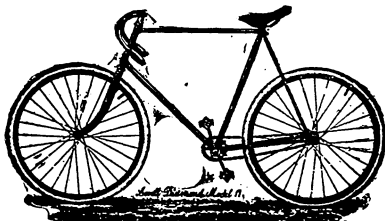
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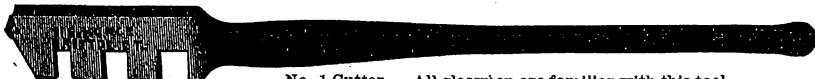
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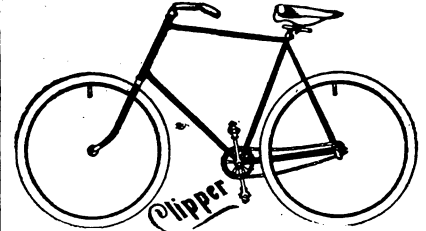
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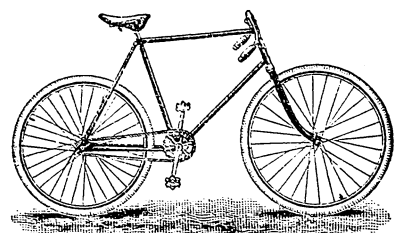
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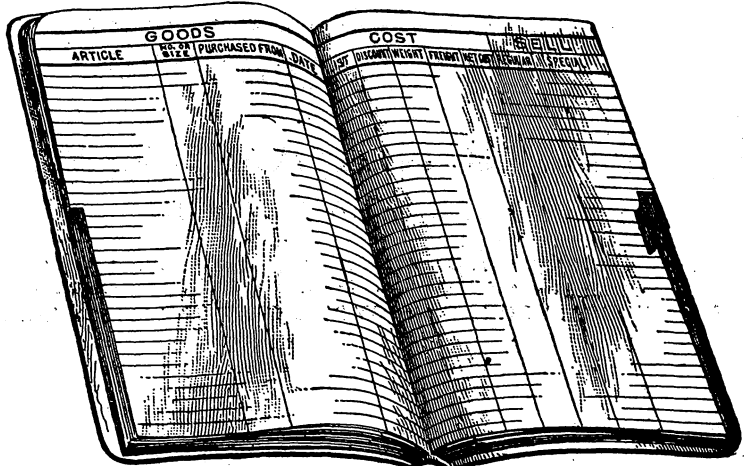
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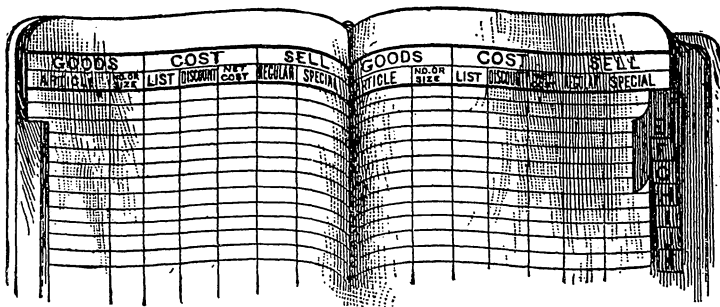
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In this book each page is complete, and the record of prices does not, as in Book A, run across two pages. Thus it accommodates a larger range of goods with much less detail in the record. It is adapted for office or store use, and by the use of familiar abbreviations, sufficiently large for the convenient and concise record of prices.

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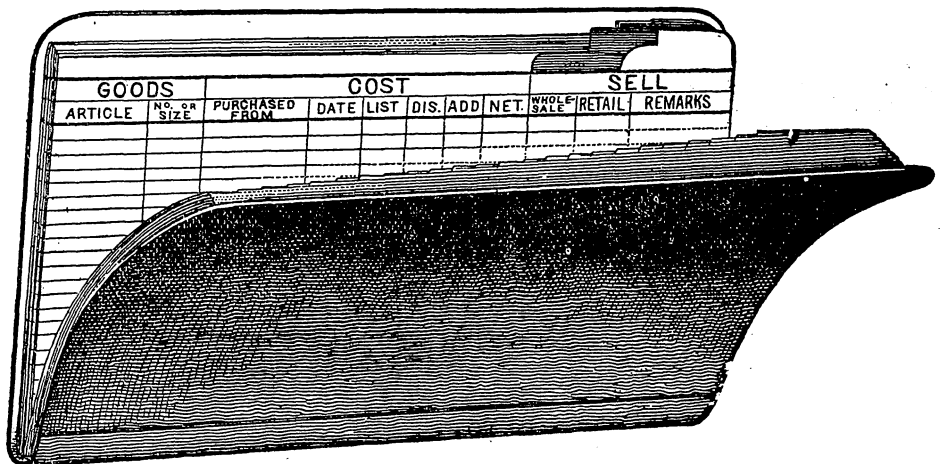
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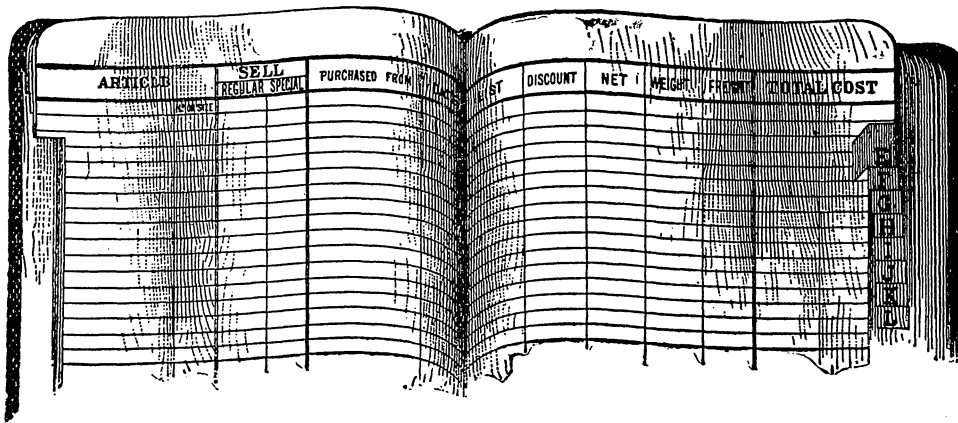
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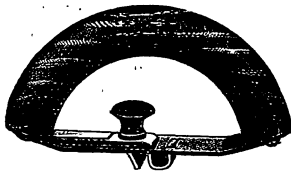
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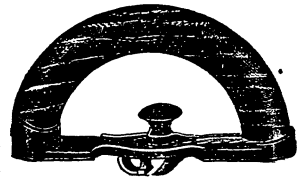


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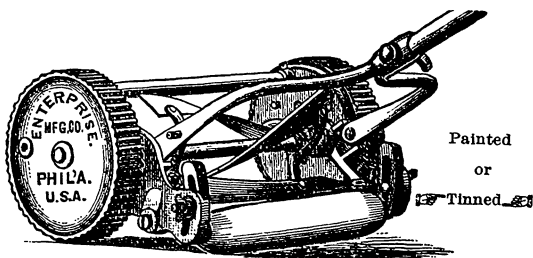
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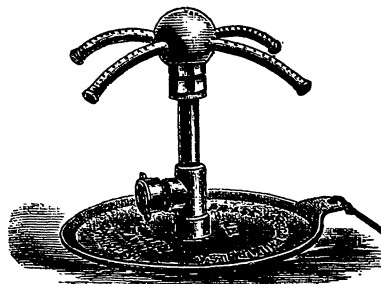


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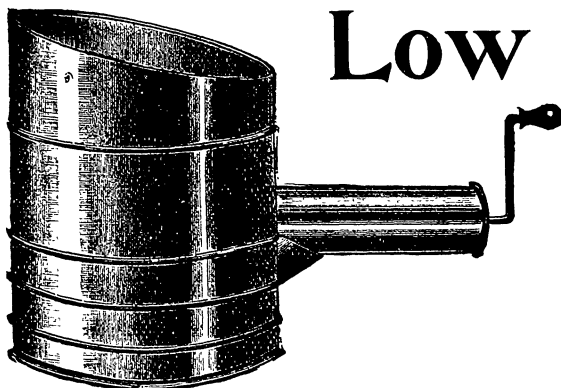
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A simple, clear and accurate presentation  
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several States relating to the rights of prop-  
erty, contracts, debts, partnerships, bank-  
ruptcy, insurance, corporations, marriage,  
divorce, &c., &c., with which are included  
correct copies of all legal instruments and  
forms, such as notes, deeds, mortgages, leases,  
wills, &c., and a dictionary of legal words  
and phrases.

Sent, post-paid, on receipt of price, by

**DAVID WILLIAMS,**

Publisher and Bookseller.

96 - 102 Reade St., New York

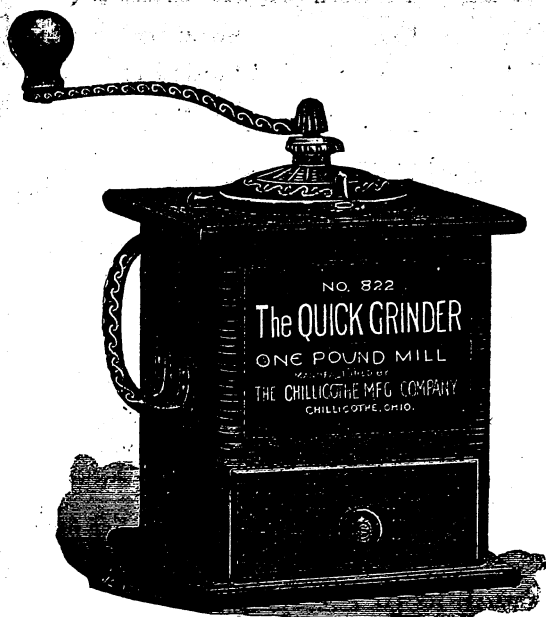
THE CHAS. PARKER CO. MERIDEN  
MANUFACTURERS OF  
THE PARKER GUN VISES THE PARKER LAMP  
WOOD SCREWS COFFEE MILLS,  
CABINET-LOCKS SPOONS &c.



This illustration represents our Columbia One-Pound Mill No. 260.

The Handsomest and Best Mill of this Character in the Market.

We have over sixty other styles and sizes. Catalogues furnished dealers.



We make 19 sizes of Ideal  
and Quick Grinder Mills.

IN THE SPRING a young man's fancy lightly turns to thoughts of love, then a wife, and finally a coffee mill. How supremely ridiculous! Love and coffee grinders don't seem so closely allied at first thought. In some sections there is not so much sympathy between the two.

A year or two ago The Chillicothe Mfg. Co. introduced the "pound" coffee mill and "discovered" a new metal for their grinders which they called "steel alloy," more recently "discovered" by another Co. making a few coffee grinders, a little wind and no dividends.

Now we bought out the Chillicothe Co., tooth and toe nail, and because we are putting the raw material into nicely finished stock the more recent discoverers of Am—we mean "steel alloy," say our goods are "shoddy." That is real mean, ain't it? We don't care a durn. So long as we can sell ten thousand coffee grinders a month, which we have done so far this year, we ain't going to find fault. We just keep grinding 'em out and grin.

Oh, this is a jolly world.

Waddel Wooden Ware Works, - Greenfield.

Situate on Paint Creek, Madison Township, Highland County  
and in the best town in Southern Ohio.

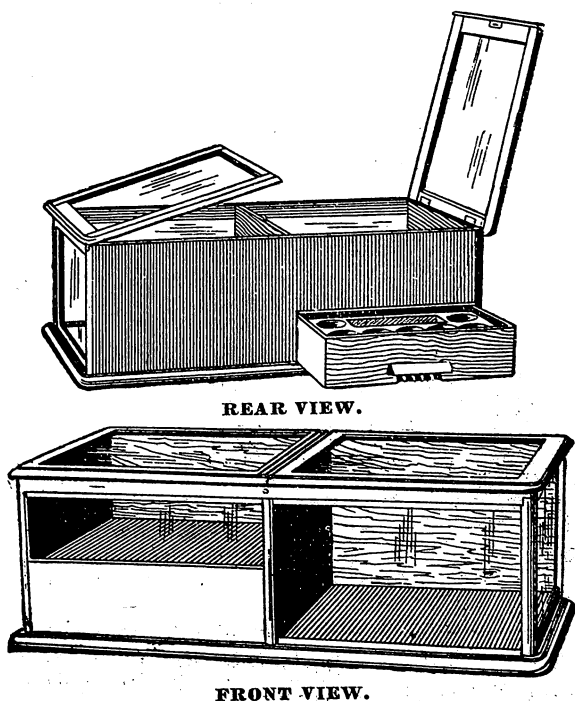
# Sift It Down Fine.



And where can you find a sifter that excels in any particular "The Hunter?" We will not even except price. If you want the best, and who does not? and that promptly, we can furnish them. We are now able to turn out over 4,000 daily. If others are so much superior, why don't they sell? Write for prices.

**The FRED. J. MEYERS MFG. CO.,**  
**HAMILTON, O.**

F. J. MATTISON, Eastern Agent,  
69 Beekman St., NEW YORK.



**THIS IS**

**What You are Looking For.**

**A COMBINED**

**Showcase and Money Drawer,**

**With Combination Lock on Money Drawer.**

**SUSCEPTIBLE OF 33 CHANGES.**

Can be set to a different combination in an instant, without removing drawer. Opening the drawer automatically unlocks the showcase. Closing drawer locks it. The case cannot be opened from the outside, and can only be opened by knowing the combination to lock of money drawer. An Alarm Bell is Sounded every time Drawer is opened.

**Large Roomy Cases and Money Drawer.**

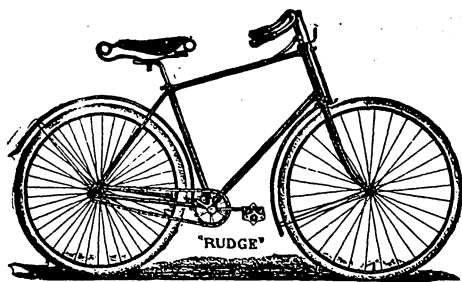
**Special Space for Books or Papers.**

The Case is strongly and substantially made of Quartered Oak, Hard Oil Finish. Neat, attractive, practical, and a useful novelty. **Hustling Dealers can sell Hundreds of them.**

Be quick if you want the cream of the trade. For particulars write **THE SUN MANUFACTURING CO., Greenfield, Ohio,**

MANUFACTURERS OF

**Combined Single and Double Showcases and Money Drawers, Combined Showcases and Cash Registers, Wooden Ware Specialties and Novelties.**



## HARDWARE DEALERS AND RUDGE CYCLES.

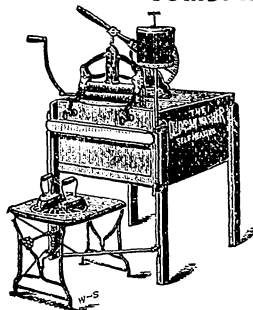
Agents wanted immediately for unoccupied territory. Write for illustrated catalogue and Price-list of 1894 Wheels.

## The Bronson Supply Co.,

Sole Agents for the United States.

72 Beekman St., New York.

### COLUMBIAN WASHER and STOVE COMBINED.

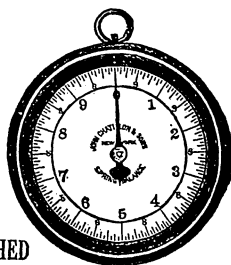


The most complete washer on the market.

Benbow  
M'f'g Co.,  
St. Louis.

## John Chatillon & Sons,

85, 87, 89, 91, 93 CLIFF ST., NEW YORK.



ESTABLISHED  
1835.

SEND FOR  
PRICE-LIST.

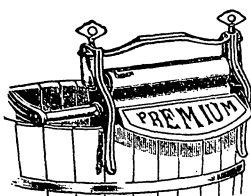


Sole Agents for

Foster Bros.' Butchers' Cutlery.



John Chatillon & Sons, N. Y.



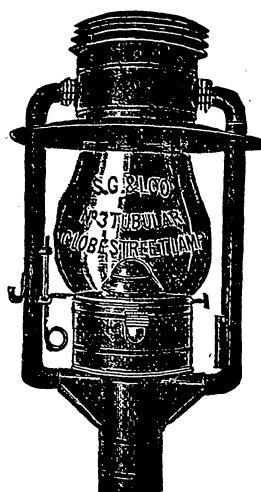
### COLBY WRINGER CO., - Montpelier, Vt.

MANUFACTURERS OF THE

### Premium Wringer,

With Automatic Apron Adjustment.

SURPLESS, DUNN & ALDER, Direct Representatives,  
15 Murray Street, New York.



No. 3

Globe Street Lamp.

### Light your Streets and Driveways.

The S. G. & L. CO.

## Tubular Globe Street Lamp

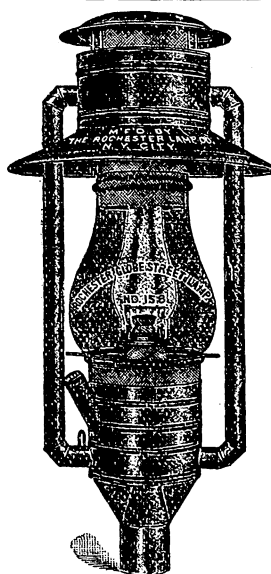
IS THE Best Street Lamp Manufactured.  
Equal to the best Gas Light.  
Will not Blow Out in the Strongest Wind.  
Will not Smoke.  
Will not Freeze.  
Automatic Extinguisher.  
Outside Wick Regulator.  
Will Burn Four Hours for One Cent.

MANUFACTURED BY

STEAM GAUGE AND LANTERN CO.,

SYRACUSE, N. Y.

Western Branch, 25 Lake St., Chicago, Ill.



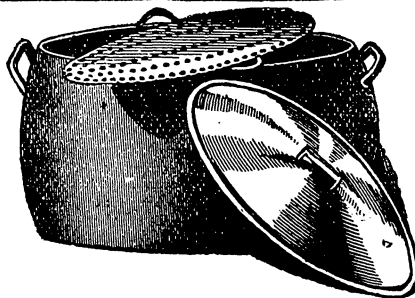
### The Rochester Globe Tubular - - Station and Street Lamp.

It's a long name, but it tells a good deal. It tells you of a new Street Lamp with "The Rochester" Central Draft Burner. A central draft burner (round flame) gives three times the light of an old style flat-wick burner. The first and only Tubular Globe Central Draft Lamp ever made! Storms, rain, snow, sleet or hail do not affect it. Burns all night. Made with either bail or post socket, with 26 inch enamel reflector if wanted, for railroad and other uses. Takes regular No. 3 or 9 street lamp globe, to be had everywhere. For Railroad Stations, Ware-rooms, Mills, Docks, &c., it is the best lamp ever made. Price, \$6.00; send for trade discount.

MANUFACTURED ONLY BY

THE ROCHESTER LAMP CO.,

42 PARK PLACE, }  
37 BARCLAY ST., } NEW YORK.



### SEASONABLE NEW SEASONABLE

The S. & P.

### ASPARAGUS AND CORN COOKER,

For Corn, Asparagus, Meats, Etc., Etc.

Blue Enamel Finish Outside. Tinned or Enameled Inside. Strainer for Lifting Out. Side Handles.

Three Sizes: No. 1, \$1.40; No. 2, \$1.60  
No. 3, \$2.00 each.

TRADE DISCOUNT, 50 PER CENT.

—SEND FOR SAMPLES. CIRCULAR ON APPLICATION.—

THE STUART & PETERSON CO., - - Burlington, N. J., U. S. A.  
SPECIAL GOODS TO ORDER.

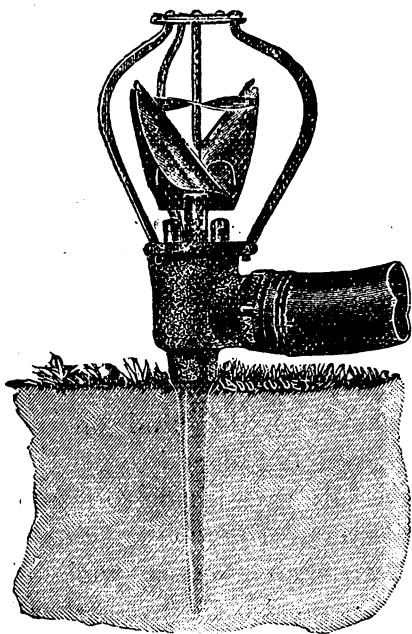
**The Best Lawn Sprinkler Ever Made at Any Price.**

**The Best Low Priced Sprinkler in America.**

Imitation is the sincerest flattery. They copy our ideas, but they don't get there with the kind of Sprinkler the people want.

*This Sprinkler will throw Water in a complete Circle or Half Circle as desired.*

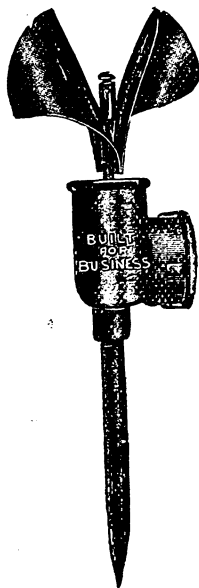
**"The HUSTLER"  
LAWN SPRINKLER.**  
BUILT FOR BUSINESS.



Patented October 20, 1891.

## Bonnette's Arc Lawn Sprinkler.

We claim this is the only perfect Sprinkler in existence. It is simple, will not wear out nor clog up. Its full flow always, whether on the whole or half circle, prevents the straining or bursting of the hose. This is not true of any other sprinkler made. It is well made and handsomely nickeled, is boxed singly with full directions how to use it. Its merits are without question pre-eminently superior to any other.



Bonnette's Patent.

Lawn Sprinkler ever put upon the market at a Popular Price.

We down all competition,  
And admire mere opposition,  
Yet under no condition  
Will we budge from our position,  
THAT THIS IS  
The Most Practical,  
The Most Sensible  
AND THEREFORE  
The Most Serviceable

PLEASE SEND IN YOUR ORDERS TO  
**JOHN H. GRAHAM & CO., General Agents,** 113 Chambers St., New York City.  
BONNETTE ARC LAWN SPRINKLER CO., Bay City, Mich. GIBBS MANUFACTURING CO., Canton, Ohio.

## THE "NOISELESS" STORE LADDER.

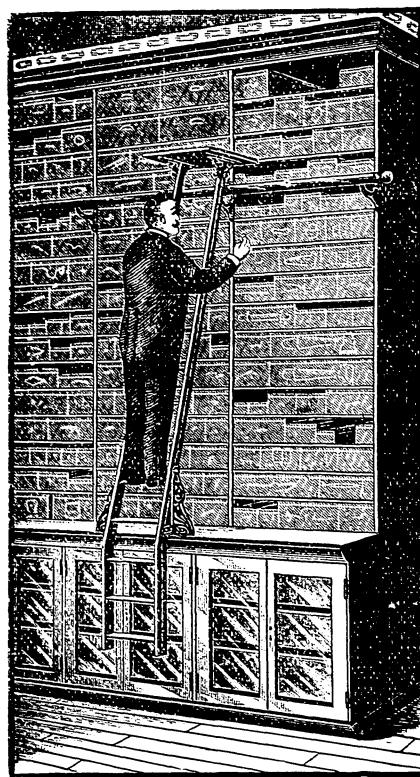


The latest and best. Perfectly noiseless. Neat in appearance

Manufactured by

**M. CROISSANT,**

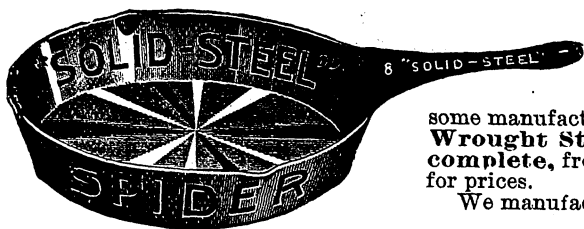
ALBANY, N. Y.



### THE BICYCLE STEP LADDER.

Highest Award, Columbian Exposition.  
The Newest, Neatest, Simplest, Easiest Operated and Safest Store Ladder made.  
Ladders are not Suspended, but Supported from below on wheels. Move easier with operator on than others when empty. Highly finished, and very handsome. Made in different grades and prices to suit. Send for illustrated catalogue and prices. See this space next week for other styles.

The Bicycle Step Ladder Co., 50 State Street, Chicago, Ills.

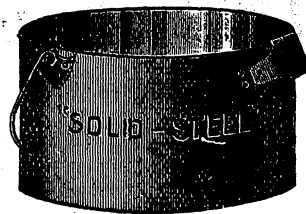
**"SOLID-STEEL" SEAMLESS HOLLOW WARE.**

No Seams, no Rivets in "Solid-Steel" Ware.

**Brilliant Finish.**

Notwithstanding the claims made by some manufacturers' agents our spiders are made from **Wrought Steel, Without Seams or Rivets complete, from a single piece of metal.** Write for prices.

We manufacture our own goods.

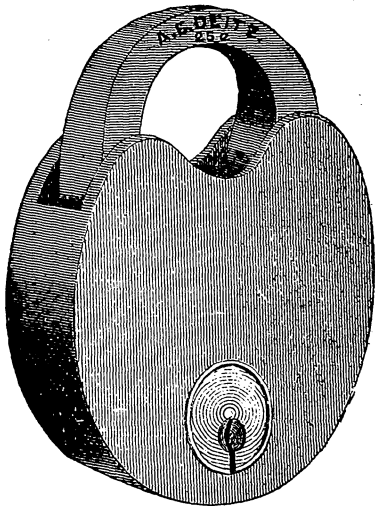


"Solid-Steel" Maslin Kettle.

**The Cleveland Stamping & Tool Co., Cleveland, O.**

**We do Light and Heavy Stamping and Blanking. Also build Dies and Stamping Machinery.**

**A. E. DEITZ**



**J. C. McCARTY & CO., Agents,**  
97 Chambers and 81 Reade Sts., New York

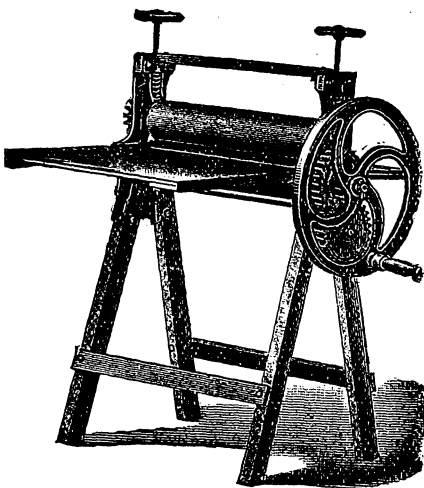
Factory, **BROOKLYN, E. D., N. Y.**

**The Family Mangle.**

**WARRANTED TO DO**  
**Better Work than Hand-Work**

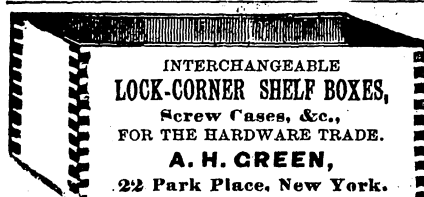
**SAVES** all the fuel,  
two-thirds the work.  
Keeps the linen whiter.

We Guarantee Every Machine.



Send for descriptive circular to

**S. C. Johnson, Racine, Wis.**  
**Agents Wanted.**

**An Investment**

✱ That soon pays for itself, and a fixture you will wonder  
✱ how you have got along without. Hundreds of recommendations to this effect. This is without doubt the best device of the kind on the market to-day. Steel rail planed to get the smoothest surface. Brackets made to fasten to standards, pilasters, or shelving direct. Can be adjusted to shelving with wide or narrow ledge, and can also be fitted where there is no ledge and can be used on circular rail as well.



**WORLD'S FAIR AWARD.**

A postal card will get our Catalogue.

**Morley Brothers,**

123 N. Washington Ave., Saginaw, Mich.

**The Utility Washboard**

Is a Zinc Board made from best quality No. 6 Zinc, the heaviest and strongest Zinc in use for Washboards.

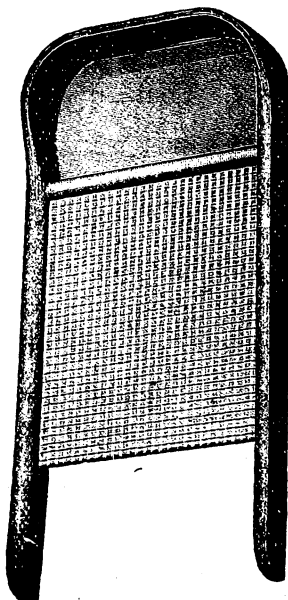
**CRIMP**—The Crimp is our Improved Deep Globe acknowledged far superior to any now in use on other boards.

**OFFERS**—absolute protection from water at sides as well as the top of the soap board.

**WHY?**—Because being made of one piece which is bent thin and broad at the sides and top of soap board where all splashing occurs, it is impossible in washing to splash over it.

**CONSTRUCTION**—The Board in point of construction excels anything of its kind ever produced. Its lines present a symmetry and regularity pleasing to the eye, and in point of strength is unquestionably superior to any.

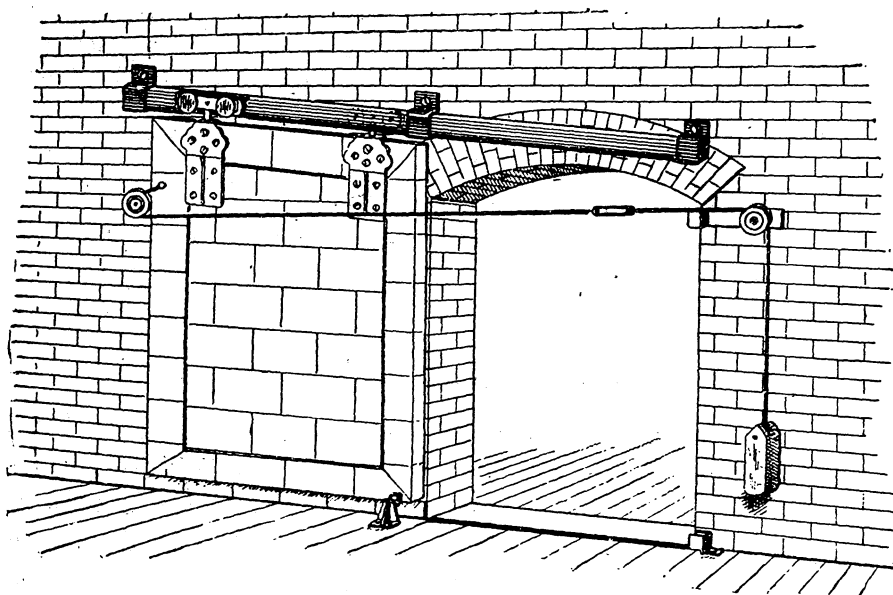
**SALES**—Where these are offered for sale competing boards are not "in it."



MANUFACTURED BY

**Olds Wagon Works,**  
Fort Wayne, Ind., U. S. A.

# THE COBURN SELF CLOSING FIRE DOOR.



## EQUIPPED WITH AUTOMATIC FIRE DOOR FITTINGS.

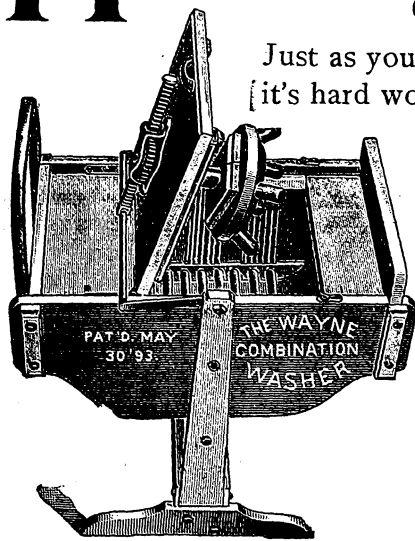
The only absolutely fire-proof runaway in the world. This can be applied to brick walls at a less expense to builder than any other device. No woodwork to warp, wear or burn or to protect with a covering of tin. Track cannot be twisted off the wall by excessive heat, and in case of fire the door will hang as long as wall stands, the track being bolted direct to the brick walls. More easy to apply than any other fixture.

**GET** our CATALOGUE of  
**PARLOR BARN FIRE** Door Hangers,  
 —AND—

## TROLLEY STORE LADDERS.

**COBURN TROLLEY TRACK MFG. CO.,**  
**HOLYOKE, MASS.**

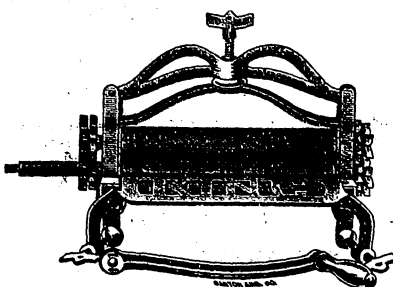
## Hard Work or Easy Work,



Just as your customer chooses. If she finds [it's hard work washing, it's because she hasn't used the Wayne Combination Washer; she'd rather waste time with the old-fashioned hand rubbing way. Now, suppose you tell her about our machine; it's a sale for you and money in both of our pockets. What say you?

For Prices and Discounts write

**Anthony Wayne Mfg. Co.,**  
**FT. WAYNE, IND.**



**We are Sole Manufacturers of the Celebrated Erie and King Wringers.**

We also make all other brands of Wood and Iron Frame Wringers.

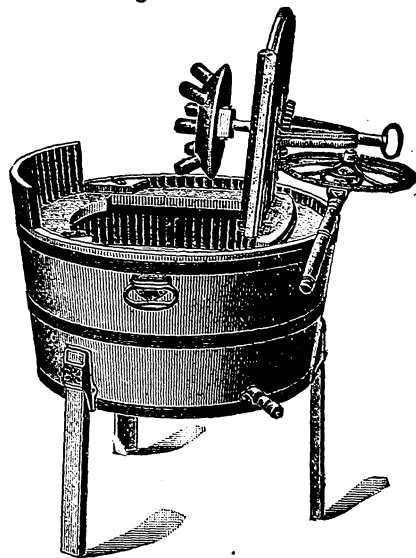
Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

Write for Catalogue.

**THE NATIONAL WRINGER CO., CANTON, OHIO.**

New York Office, 107 Chambers St., John T. Ryan, Mgr.

## The Corrugated Round Washer.



Our Special Construction, Superior Workmanship, Beauty of Finish, and recent Patented Improvements,

Cause thinking dealers to investigate this washer, with but one verdict—

**IT IS PERFECTION.**

Write for bottom prices.

**DIETHER & BARROWS, Fort Wayne, Ind.**

## HARDWARE SHELF BOXES

Made of Wood. No screws or nails used to work out and cut your shelving.

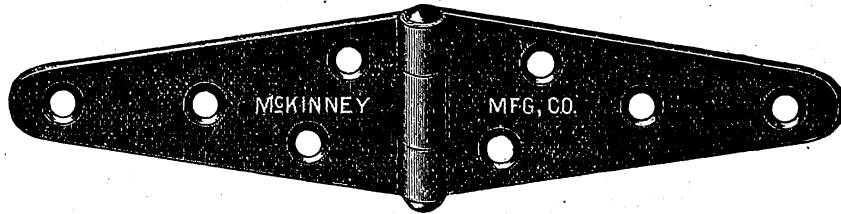
Look the matter up. Descriptive circular with list of references and prices mailed on request. We also make Wire Stitched Folding Paper Boxes and all other kinds of Paper Boxes. Write us. **JESSE JONES & CO., 615 and 617 Commerce St., Philadelphia.**

# STEEL HINGES AND BUTTS.

— STANDARD GOODS. —

McKINNEY MFG. CO.. - ALLEGHENY, PENN.

SEND FOR  
LIST.

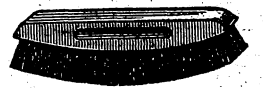


ORDERS FILLED  
ON SIGHT.

**"NONE BETTER."**

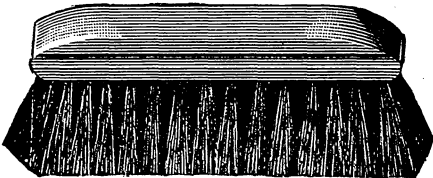
JOS. LAY & CO. RIDGEVILLE, INDIANA,

— MANUFACTURERS OF —



No. 10 Hard Molders' Brush.

No. 8 Soft Molders' Brush.



Hard and Soft Molders' Brushes, Steel Wire Casting Brushes, Stable, Shop, Street, Boat and Carpet Brushes, Brooms and Brushes of all kinds.

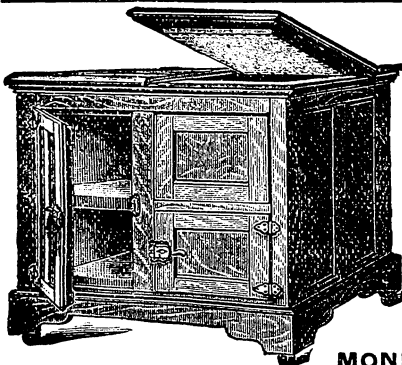
HIGH GRADE.

LOW PRICED.

To <sup>YOUR</sup> Interest !

A FAC-SIMILE OF THE ADVERTISEMENT WITHIN THE MARGINAL LINES BELOW WILL APPEAR DURING THE RETAIL SEASON IN MOST OF THE LEADING MAGAZINES AND HOUSEHOLD PUBLICATIONS.

WOULD IT NOT BE TO YOUR INTEREST AS A DEALER TO PREPARE



The superiority of Stoneware Lining in Refrigerators becomes obvious at a glance. It neither sweats nor absorbs moisture and never becomes sour or musty. It is made without open seams; is practically indestructible and is very easily cleaned.

## Stoneware Lined Refrigerators

are built upon the best known principles of refrigeration. A perfect circulation of dry, cold air prevents the accumulation of gases and vapor or the mixture of flavors, while the consumption of ice is greatly reduced. The first cost is greater than for ordinary refrigerators but they are far cheaper in the end. If your dealer don't keep them, write for Catalogue. We pay the freight.

MONROE REFRIGERATOR CO.,

LOCKLAND, OHIO.

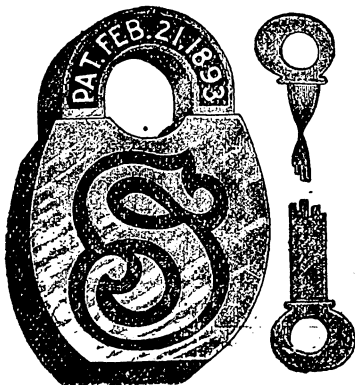
IN GOOD TIME FOR THE DEMAND THAT WILL THEREBY BE CREATED ?

### AS A RULE

WE SELL BUT ONE DEALER IN A TOWN, AND WILL NOT SELL TO CONSUMERS IN PLACES WHERE OUR GOODS ARE SOLD BY DEALERS, BUT WILL REFER INQUIRIES TO THE DEALERS.

WRITE FOR CATALOGUE AND TRADE DISCOUNTS.

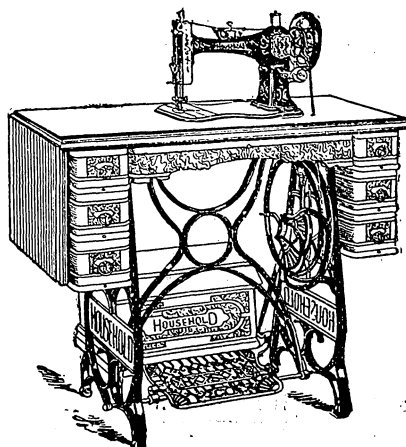
THE SCHULTZE LOCK  
UNPICKABLE.



SEND FOR CIRCULAR.

MANUFACTURED ONLY BY

The Schultze Mfg. Co.  
Cor. Emerald & Wishart Sts., Phila., Pa.



## THE EASY RUNNING "HOUSEHOLD" SEWING MACHINE

Received Highest Award at the  
World's Fair.

Unequaled for Capacity, Simplicity, Durability and Modern Construction.

It is the Best Sewing Machine in the world.

Dealers wanted in all unoccupied territory.

Household Sewing Machine Company,  
Providence, R. I.

9 East 14th St., New York. - 40 West St., Boston.  
141 Lake St., Chicago.

THE CLARK MFG. CO.,

Blind Hinges, Gate Hinges, Door Butts,  
And other HARDWARE SPECIALTIES,  
BUFFALO, N. Y.

TEMPORA MUTANTUR ET NOS MUTAMUR IN ILLIS.

**RUSSELL & ERWIN MANUFACTURING CO.,**

NEW BRITAIN, CONN.

NEW YORK.

PHILADELPHIA.

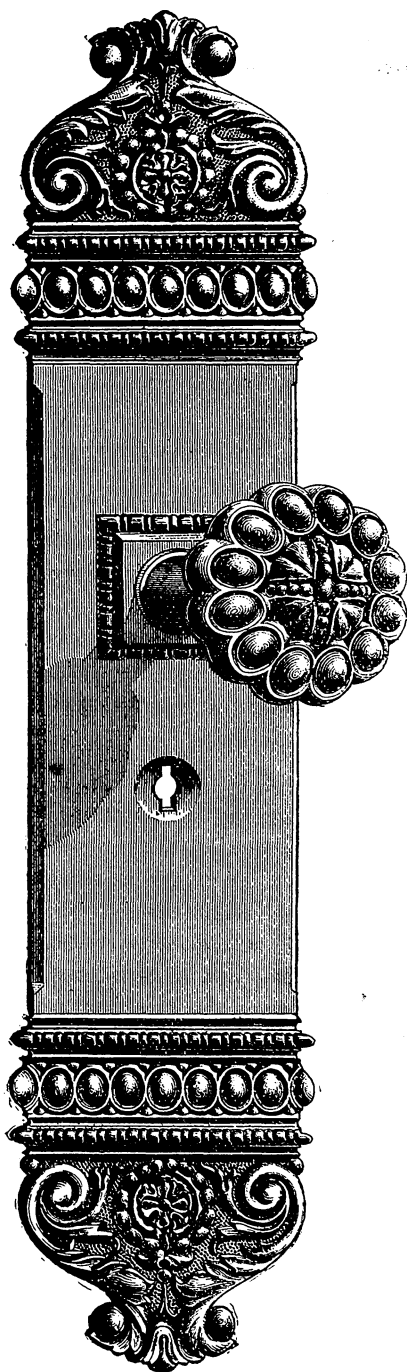
BALTIMORE.

LONDON.

MAKERS OF

**Artistic Hardware in Iron, Brass and Bronze Metal.**

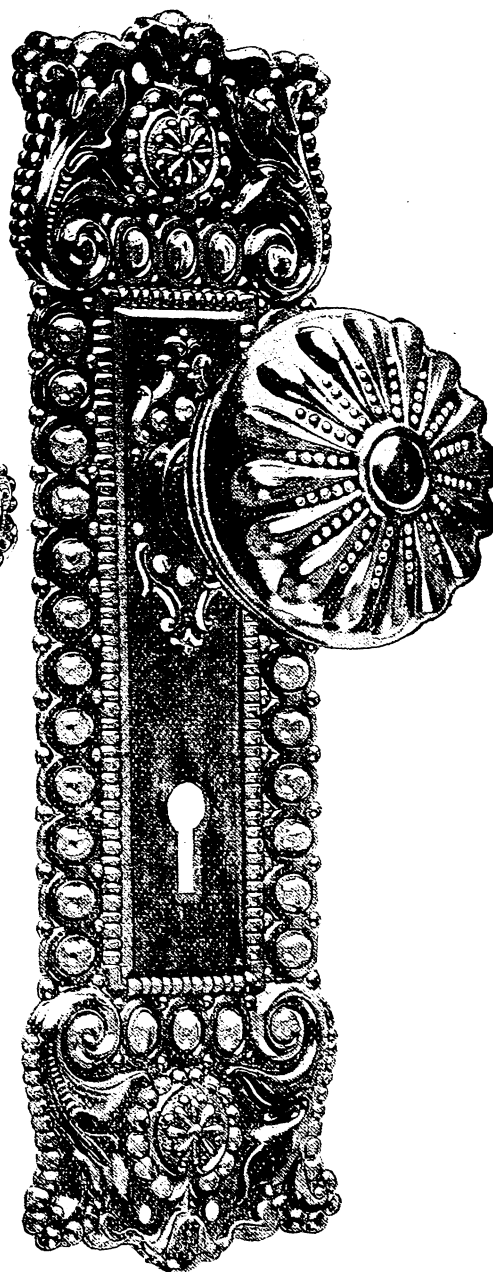
FOR RESIDENCES, OFFICES AND PUBLIC BUILDINGS.



(Illustration Half Size.)

Knob No. 761.  
Escutcheon No. 749.

(Illustration Half Size.)

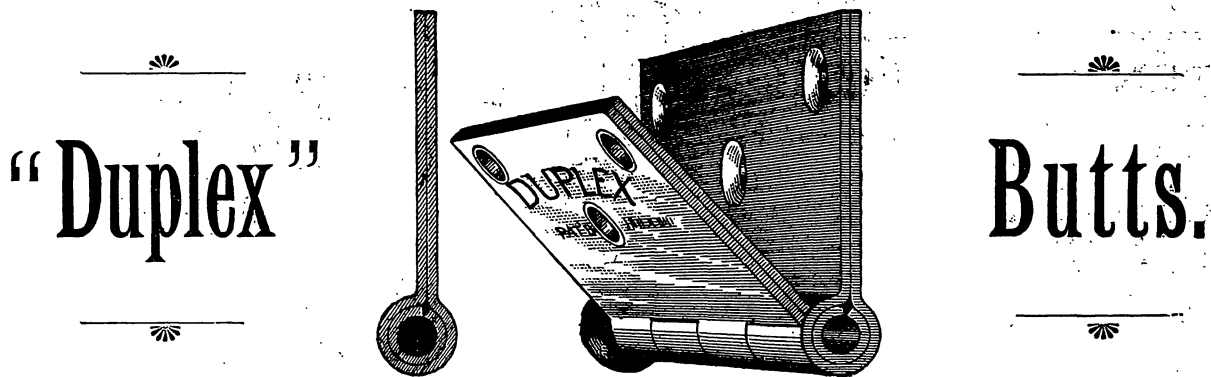
Knob No. 661.  
Escutcheon No. 699.

(Illustration Three-quarter Size.)

Knob No. 689.  
Escutcheon No. 0198½.Sole  
Manufacturers of**Columbia Cylinder Locks and Latches  
AND WROUGHT STEEL LOCKS.**

# READING Hardware Company

MANUFACTURERS OF



Patented April 19, June 21 and December 13, 1892.

## DUPLEX STEEL BUTTS

are guaranteed superior to every other kind in point of strength, durability and beauty of finish. They are made of double thicknesses of

## COLD ROLLED STEEL

by a new patented process, of which we are sole owners.

They have perfect fitting Wrought Steel Pins with handsome Ball Tips. All sizes have our Patent Hardened.

## STEEL BUSHINGS

which extend through the entire length of barrel, making them practically indestructible. The "Duplex" are Electro Plated in the best manner and are

## DROP HAMMERED

before plating. This produces a perfectly smooth and even surface which resists atmospheric action and adds to the durability of the finish.

Be sure to order ' DUPLEX ' and you will get the

## BEST WROUGHT BUTTS MADE.

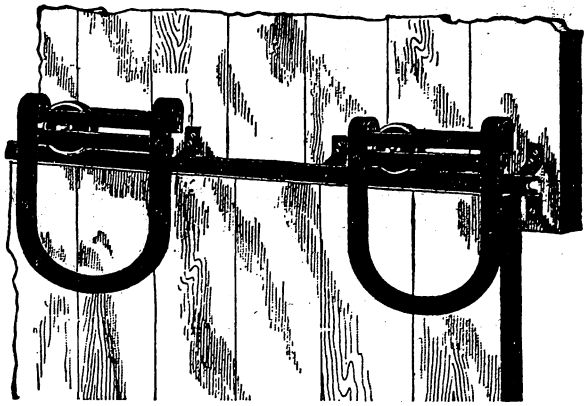
ALSO IN WROUGHT BRONZE. ALL SIZES AND FINISHES.

NEW YORK,  
96 and 98 Reade St.

PHILADELPHIA,  
514 Commerce St.

CHICAGO,  
73 Wabash Ave.

FACTORIES AND MAIN OFFICE, READING, PA.



## Lane's Patent Steel Barn Door Hangers,

"O. N. T." Track for same.

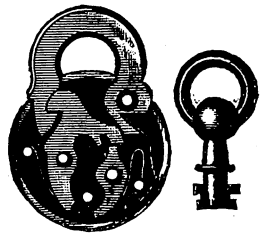
The first Anti-friction Steel Door Hanger placed upon the market and to-day stands as the original and best. Sold in all the States of the Union, as well as abroad. Also Lane's Noiseless Steel Parlor Door Hanger, using Single Steel Track, a great success.

Lane's Pat. Self-measuring Faucet, measuring liquids as drawn. Swift's Coffee Mills in great variety.

Manufactured by **LANE BROS.**, Poughkeepsie, N. Y.

JOHN H. GRAHAM & CO., General Agents, 113 Chambers St., NEW YORK.

## PATENT PERFECTION PADLOCK.



*Eight Tumblers, Key Turning Both Ways.*

Sizes,  $\frac{1}{4}$  inch to  $2\frac{1}{4}$  inches, of cast bronze. Defies competition for quality and price. No steel or iron used, cannot rust, and cannot be picked. Also,  $\frac{1}{2}$  and  $\frac{3}{4}$  inch Padlocks, opened with a common pin, in brass and nickel, for cats and small dogs. The best Railroad Switch and Car Lock in the world.

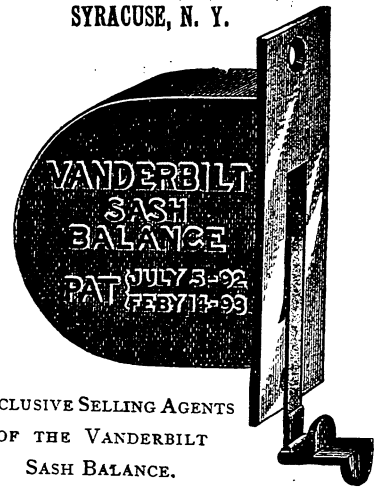
Adopted by the United States Treasury for bonded warehouses.

**AMES SWORD CO., Chicopee, Mass.**

Send for Price-Lists and Circulars.

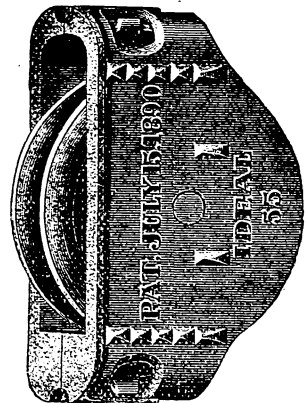
## E. C. STEARNS & CO.,

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EXCLUSIVE SELLING AGENTS  
OF THE VANDERBILT  
SASH BALANCE.

## Ideal Sash Pulley, No. 55.



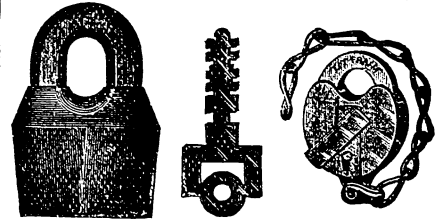
Adapted for auger socket or machine made mortise. Applied without chisel or screws, quickly and a perfect fit in every case. The only all round Sash Pulley made. Sample free. Price on application.

**STOVER MFG. CO.,**  
145 River St., Freeport, Ill.

ESTABLISHED 1879.

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Originators, designers, patentees and manufacturers of all the leading popular styles of **ADLOCKS**, Key-Locking Scandinavian with our patent Inter-Locking Tumblers; the only reliable lock of this style ever made. **SELF-LOCKING** Scandinavian of the highest type of perfection. Dust Proof Railroad, Freight Car and Switch Padlocks. Brass, Bronze, Steel and Malleable Iron Padlocks for all purposes and in all finishes. 131 different kinds. Write for our new 100-page catalogue.

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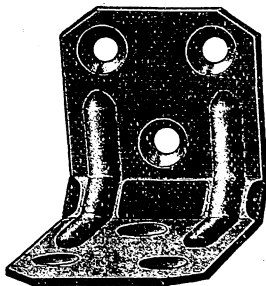
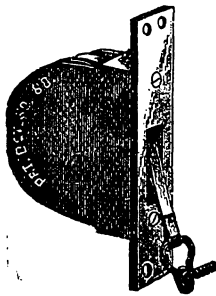
## DOES IT PAY?

To buy an inferior article, which your trade condemns, when you can get

## THE CALDWELL SASH BALANCE.

The best material, right principle and care in making and testing have made it the **LEADER** for five years. Write to

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No. 997 1-2.

## Wrought Steel CORNER BRACES Corrugated.

**A SUPERIOR ARTICLE.**

The corrugation adds largely to the strength and improves the appearance.

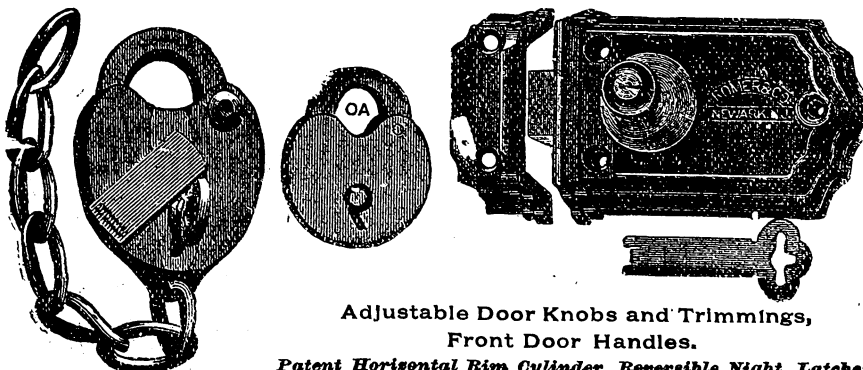
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Length of each side  $1\frac{1}{2}$  in. Plain Steel, per dozen, 30¢. Japanned, per dozen, 40¢.  
Width  $1\frac{1}{2}$  in. Bronzed, per dozen, 45¢.

**LIBERAL DISCOUNT TO THE TRADE**

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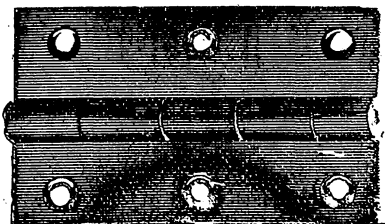


Adjustable Door Knobs and Trimmings,  
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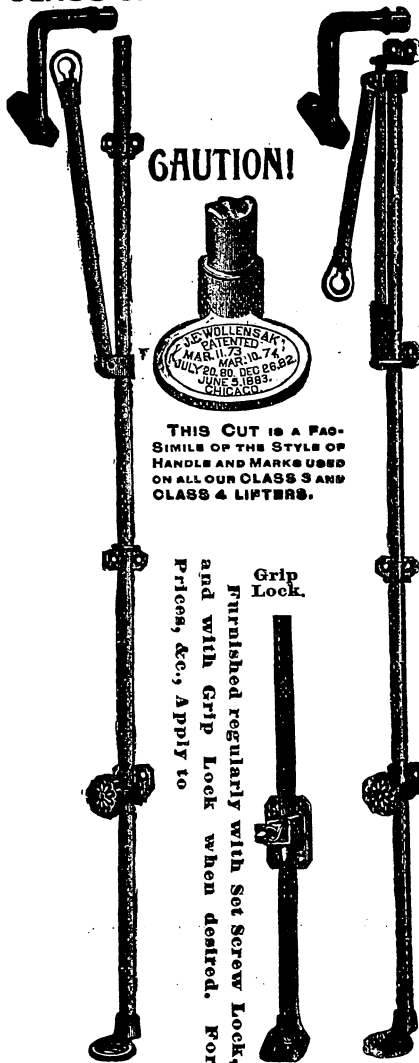
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OLD RELIABLE

**J. F. WOLLENSAK'S PATENT.**

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**CAUTION!**

THIS CUT IS A FA-  
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HANDLE AND MARKS USED  
ON ALL OUR CLASS 3 AND  
CLASS 4 LIFTERS.

Grip  
Lock.  
Furnished regularly with Set Screw Lock,  
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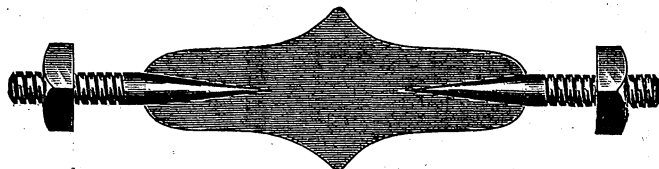
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Couplings, Clips, King Bolts, Fifth Wheels, &c.

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Showing a full line of Axle Clips, Spring Bar Clips  
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WORKS AT MAYWOOD, ILL.

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## TACKLE BLOCKS

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**The Cleveland Block Co.,**

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**ARE BETTER IN EVERY WAY.**

No waste material. Every ounce of weight in the line of  
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Is twenty per cent. larger than any other Spring Comb on the market, and is  
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It is made of Fine Spring Steel or Fine Spring Brass, and is a  
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For Sale by all First-Class Jobbers in the U. S.

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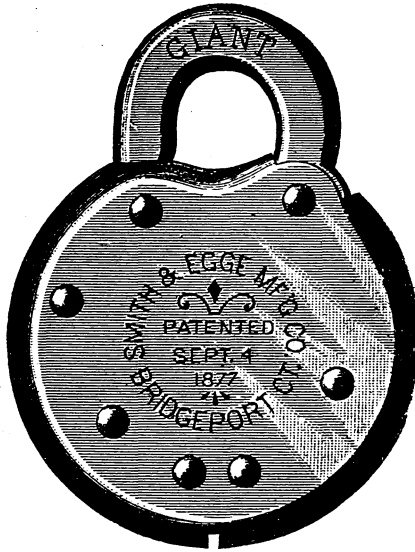
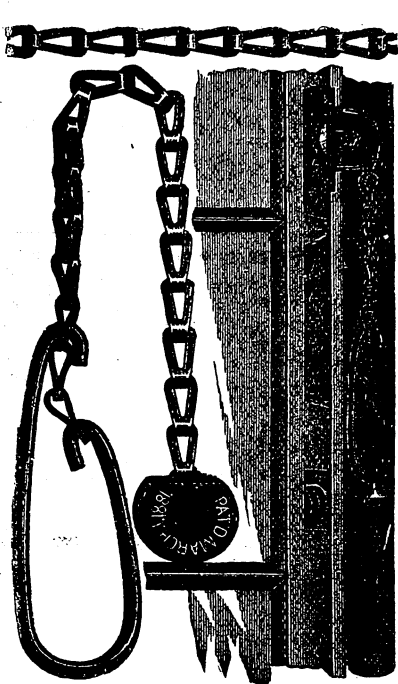
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Centennial Award. "Superior in Every Respect."  
This is one of the best selling locks in the market, and affords the dealer a large profit. It is thoroughly and strongly made—of the best material—very handsome in appearance, and every Lock is warranted. Orders solicited.

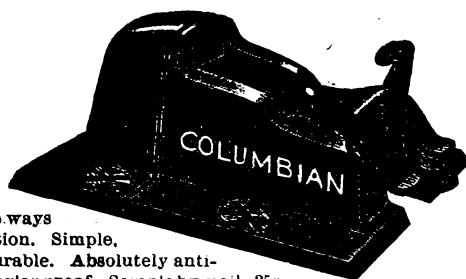
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is a substitute for cord in hanging weights to windows. It is manufactured by us only, and by automatic machinery, patented and owned exclusively by ourselves, and whereby we secure uniformity of construction and quality. We have been to great expense in producing a metal having all the qualities and conditions requisite for making suitable chain for this purpose, and to prevent other chain of the same pattern of link and of the same general appearance, but made from an inferior metal, being offered as the same thing, we patented the word "Giant" as a Trade-Mark, as applied to either metal or chain. Trade-Mark Registered April 16, 1878, and October 22, 1878, and our metal is therefore known in the market as "Giant Metal," and our chain as "Giant Metal Sash Chain."

Columbian

Sash

Lock.

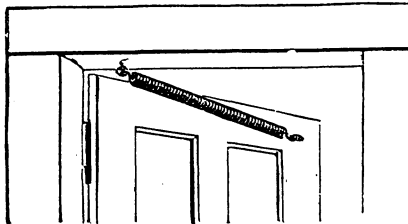


Locks three ways with one motion. Simple, strong and durable. Absolutely anti-rattle and burglar proof. Sample by mail, 35c.

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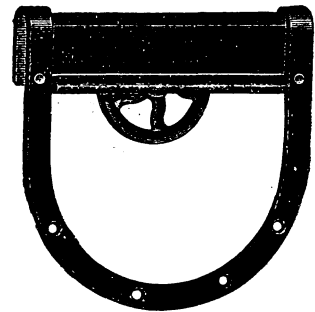


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Cheap, Simple, Durable, Effective.  
Best Screen Door Spring made. Send for our list of references, comprising some of the first houses in the land. They sell readily, and that is what you are looking for. Drop us a postal.  
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HIGHEST AWARD  
WORLD'S  
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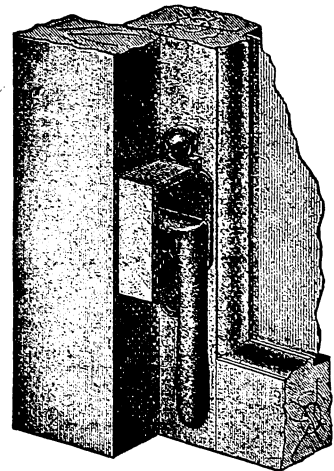
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## DOLBER'S SASH FASTENER.

Patented Aug. 1, 1893.



THE BEST DEVICE EVER INVENTED FOR FASTENING STATIONARY

Screens, Shutters or Windows.

The above shows Fastener as applied to the side of an outside window, fastening same to the outside casing.

Saves Time, Labor and Expense.

F. V. WOOSTER, 66 Beverly St., Boston.

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COIL SPRING SHAFT SUPPORT  
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Fast selling; always gives satisfaction. No weight on horse. Worth twice the cost for convenience in hitching up. Agents wanted. Send stamp for circular. Price, \$1.00. State rights for sale.

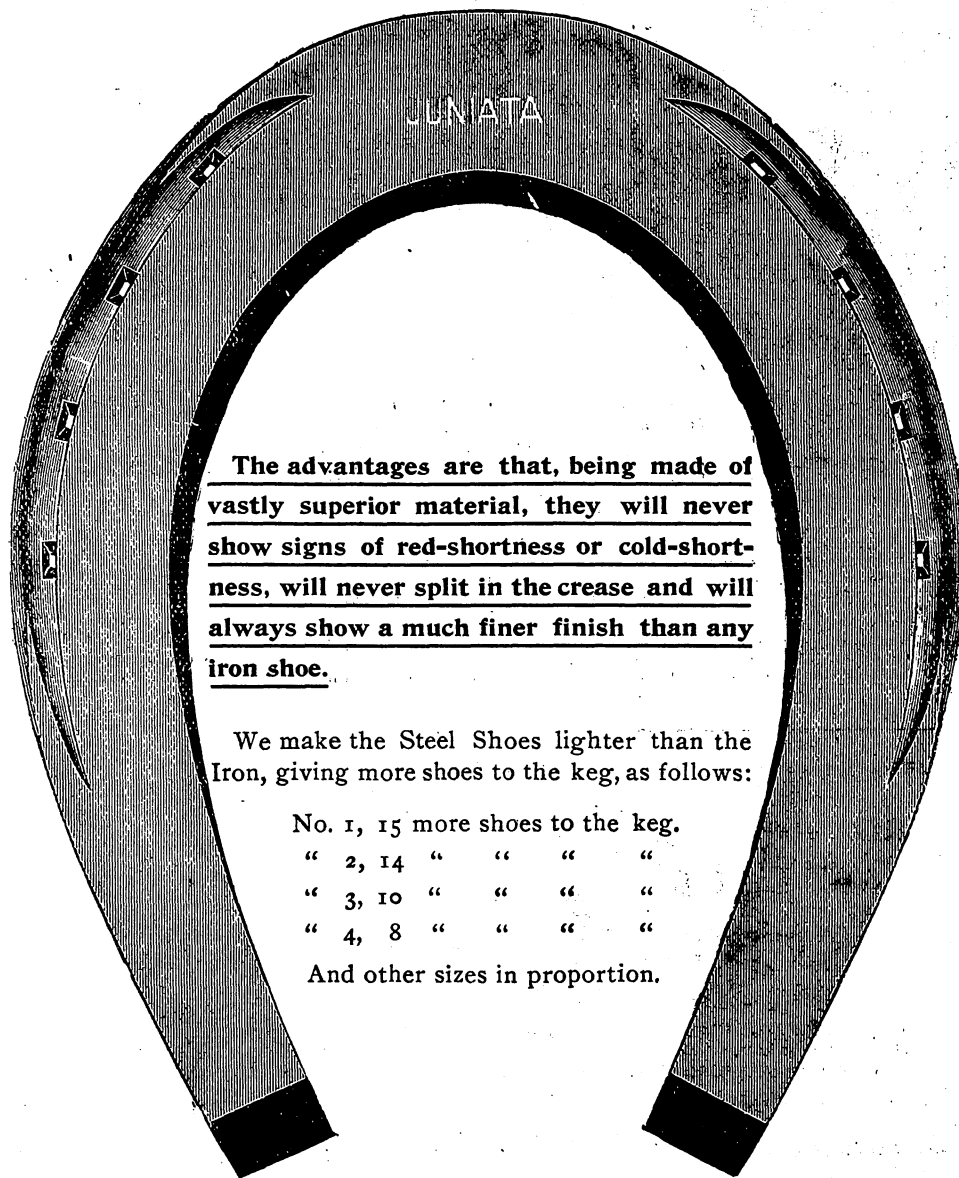
THE DECATUR SHAFT SUPPORT CO.  
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SELLS AT SIGHT!

# STEEL HORSE SHOES.

SHOENBERGER & CO., PITTSBURGH, PA.,

After numerous and costly experiments have succeeded in manufacturing a special quality of soft homogeneous steel, specially adapted to the manufacture of Horse and Mule Shoes, and are now making from this steel Extra Swaged, and Government Pattern Horse and Mule Shoes. They give the best of satisfaction everywhere and we furnish them to the trade at the same prices as the regular iron shoe sold by ourselves and our competitors. We are at present making our Roadster Pattern Horse Shoes out of Iron, but we will make them of Steel also within a short time.



The advantages are that, being made of vastly superior material, they will never show signs of red-shortness or cold-shortness, will never split in the crease and will always show a much finer finish than any iron shoe.

We make the Steel Shoes lighter than the Iron, giving more shoes to the keg, as follows:

No. 1, 15 more shoes to the keg.

" 2, 14 " " " "

" 3, 10 " " " "

" 4, 8 " " " "

And other sizes in proportion.

**No. 2 EXTRA SWAGED FRONT.**

We also beg to say that we have introduced improved machinery into our new factory and have doubled our capacity, and are now prepared to furnish the best shoe, either iron or steel, ever offered to the trade.

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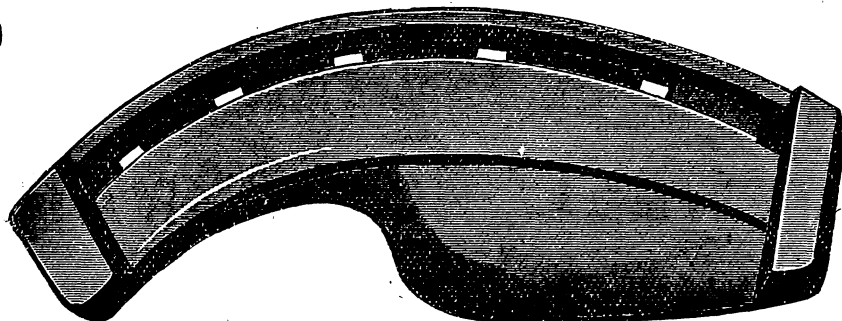
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## CARRIAGE HARDWARE AND SPECIAL DROP FORGINGS.

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SHOES.



Made under Deebie's Patent, Aug. 9, 1887.

Our 1891 pattern is a modification of the style we have made for the past four years, giving additional strength to the web.

IT IS JUST RIGHT.



## HORSE AND MULE SHOES.

Superior Quality, Shape and Finish.

BRYDEN HORSE SHOE CO.,

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### Horse and Mule Shoes of the Perkins Pattern.

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JUST TRY THEM and YOU will say they excel all others.

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Elegant Iron.

Beautiful Shape.

HORSE SHOES,

Light, Medium and Heavy.

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Light, Medium and Heavy.

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"Burden Best"

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Boiler Rivets.

The Burden Iron Co.

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**"The Best Driving Nail."**

**HIGHEST AWARD**  
—AT—  
**World's Columbian Exposition.**

In the tests submitted before the judges on awards the Capewell No. 6 was shown to be 17 per cent. tougher than No. 8 of other makes.

**"The Best Nail to Hold."**

**CAPEWELL HORSE NAILS,**  
MADE BY  
**THE CAPEWELL HORSE NAIL CO., - - - HARTFORD, CONN.**

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October 28, 1893.

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Very respectfully,  
HERMAN J. HENKE,  
Foreman Blacksmith, World's Columbian Exposition.

**The Capewell Patent Corrugated Horse Nail.**

**Needs No Clinching.**

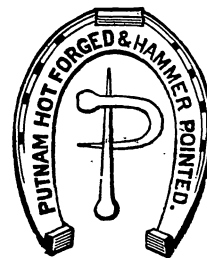
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FOR

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TO

## The PUTNAM Hot-Forged and Hammer-Pointed Horse NAILS,



At the *World's Columbian Exposition* at Chicago. A medal and diploma worded:  
*"Supreme excellence in material, method in manufacture, and quality of finished product; elasticity and smoothness combined with holding power in clinch. It allows the use of very small nails."*

There is nothing beyond "supreme excellence," nor is there anything comprised in a horse nail, except the "material from which it is made," "the method of manufacture," and "quality of finished product." Putnam nails, by their "elasticity," give slightly to the expansion and contraction of the hoof while the horse is in motion; by their "smoothness," do not enlarge the nail holes in the hoof, while their "supreme excellence," in "holding power in the clinch," enables them to hold the shoe in the hardest service until worn out.

By the "use of small nails," large holes are avoided and money saved to the smith.

Thus it will be seen that the officials of the *World's Columbian Exposition* recognize what qualities go to make up a good horse nail and that only the "Putnam" contains them all.

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MANUFACTURERS OF THE BEST QUALITY

## CARRIAGE MAKERS' HARDWARE,

MANUFACTURE THE LARGEST VARIETY OF

# FORGED CARRIAGE IRONS

Of Best Material and Workmanship.

Send for Price and Illustrated List of

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Manufactured by the NATIONAL HORSE NAIL CO.,  
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All Sizes. All Patterns. All Warranted. Sold Everywhere.

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With Steel Screws. U. S. Standard and the points hardened.



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4.....	3/4.....	60	16.....	3 1/2.....	1 80
5.....	7/8.....	70	17.....	4.....	2 10
6.....	1.....	70	18.....	4 1/2.....	2 75
7.....	1 1/8.....	80	19.....	5.....	3 25
8.....	1 1/4.....	80	20 (extra)	5 1/2.....	4 00
9.....	1 1/2.....	95	21.....	6.....	5 00
10.....	1 3/4.....	95	22.....	7.....	6 00
11.....	2.....	1 10	23.....	8.....	7 00
12.....	2 1/2.....	1 20			
One small set of 8, by 1/4 in. to 2 in. .... 6 25					
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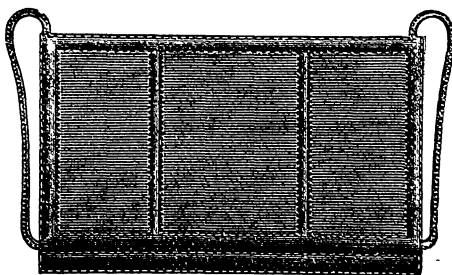
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Dashes,  
Fenders,  
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"A" PATTERN.

Largest Capacity in  
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**P. F. BURKE, C. F. DEWICK & CO.**  
Successors to  
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**FOOT VICE.**  
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Sharp Calks.

## Crescent Horse and Mule Shoes, BAR IRON.

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IRON CO.

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## FROST'S ANTI-RATTLER

Pat. Jan. 20, 1880.

Cut One-half Size.

Sample pair sent to any hard-  
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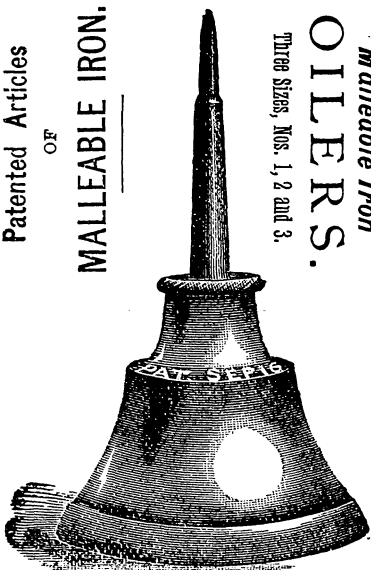
The Frost Thill Spring Co.,  
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A.M., E.M., Ph.D. This work treats of the mak-  
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Patented Articles  
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New Improved  
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OILERS.  
Three Sizes, Nos. 1, 2 and 3.

**Hammer's** Adjustable Clamps.  
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New Pattern Heavy Screw Clamps.  
*Strongest in the market.*

For Sale by all the Principal Hardware Dealers.  
SEND FOR PRICE LIST.  
MALLEABLE IRON CASTINGS  
of superior quality, and Hardware Specialties  
in Malleable Iron, made to order.

**HAMMER & CO., Branford, Conn.**

**HARDWARE DEALERS**

CAN RECOMMEND THE

## CHAMPION METAL WINDOW SASH CHAINS

to their customers as a reliable substitute for  
Sash Cords, very strong and lasting (some in  
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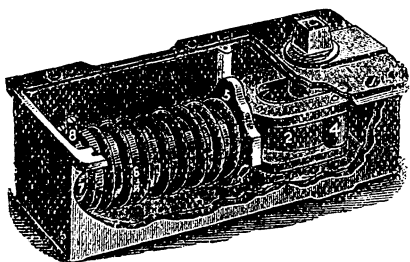
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## CHECKING SPRING HINGES

For Double or Single Acting Doors.

Applied in floor under door. They close the door  
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Case-Hardened Throughout. Parts Interchangeable.

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Forged Steel.

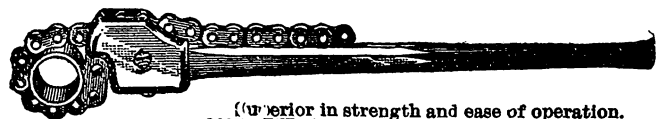
All parts interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no  
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**CHAIN  
PIPE**

**WRENCH.**



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COMPLETE circular grip. Never slips nor crushes.

Can be used with one  
hand and in closer quarters  
than any other Basin  
Wrench. Parts Interchange-  
able.



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BASIN WRENCH.**

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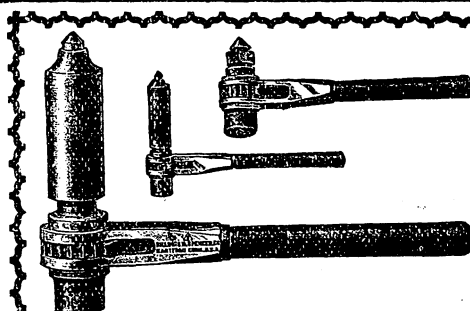
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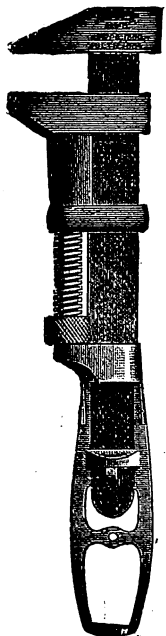
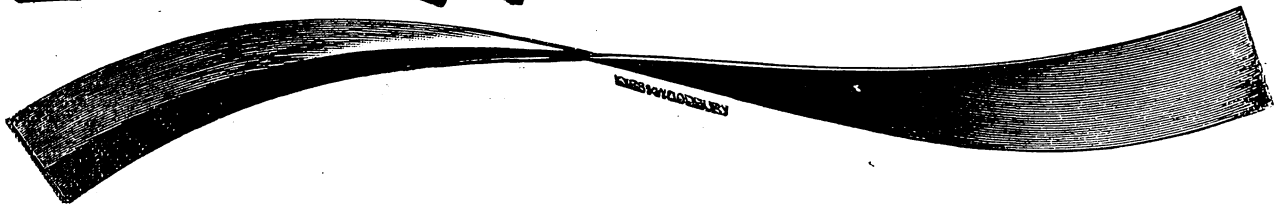
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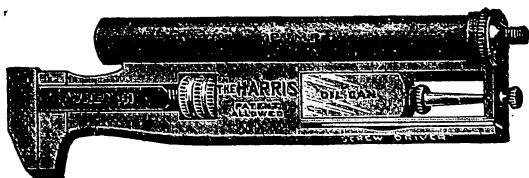
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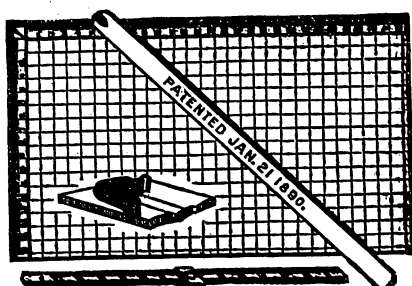
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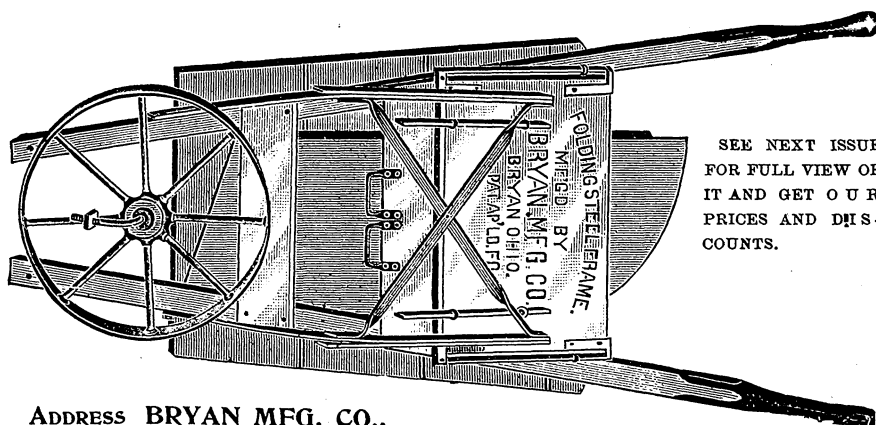
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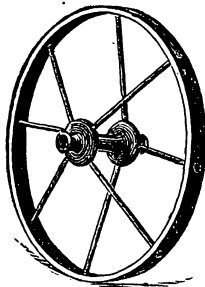
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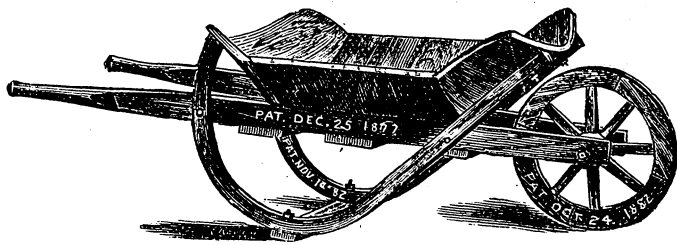


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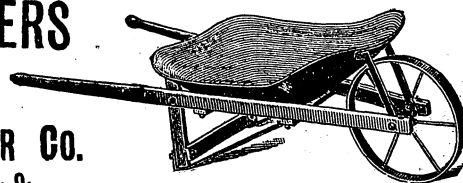
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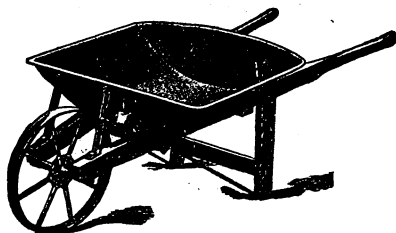
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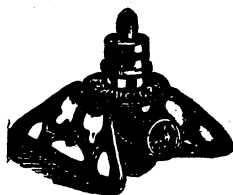
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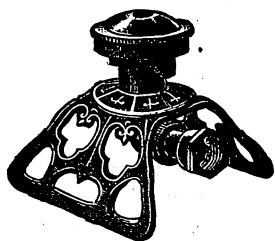
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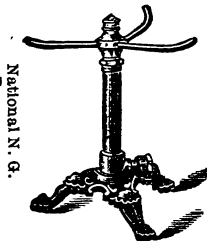
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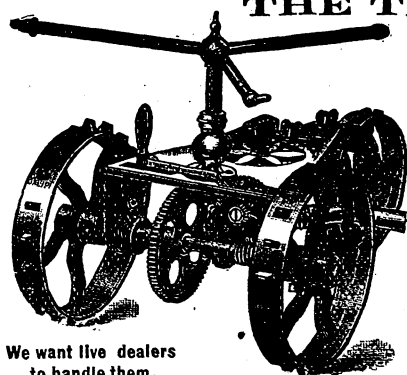
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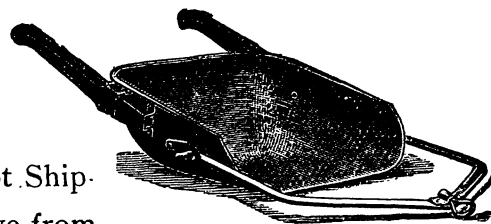
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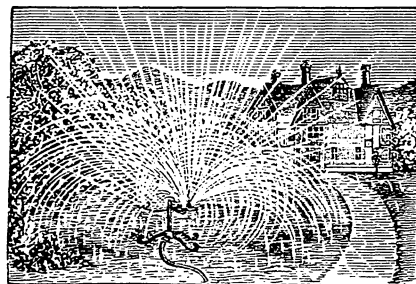
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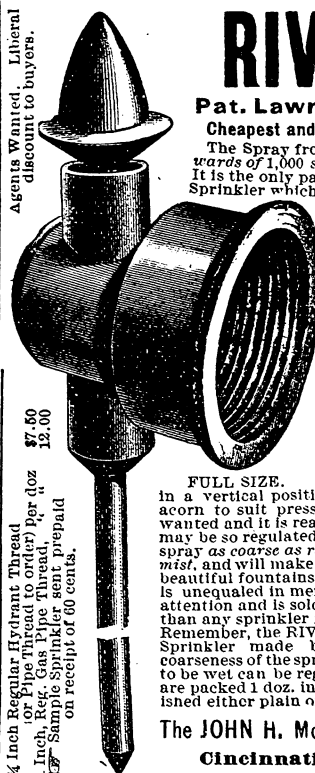


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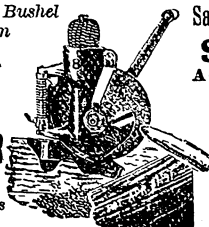
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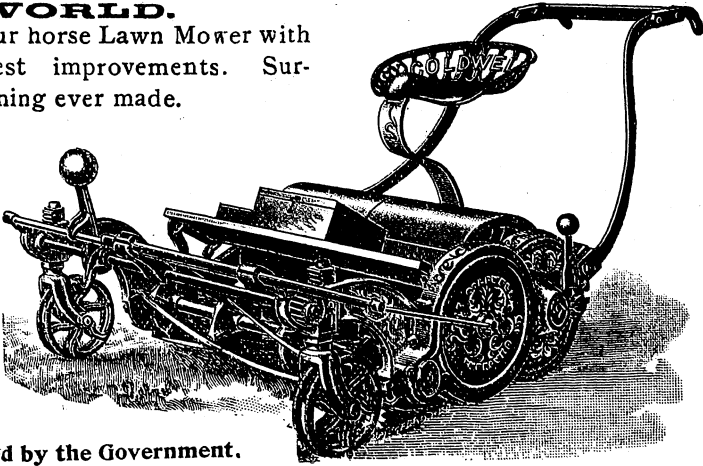
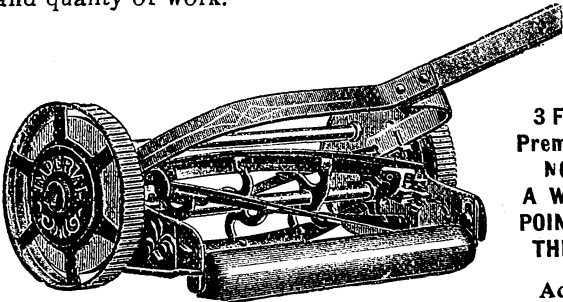
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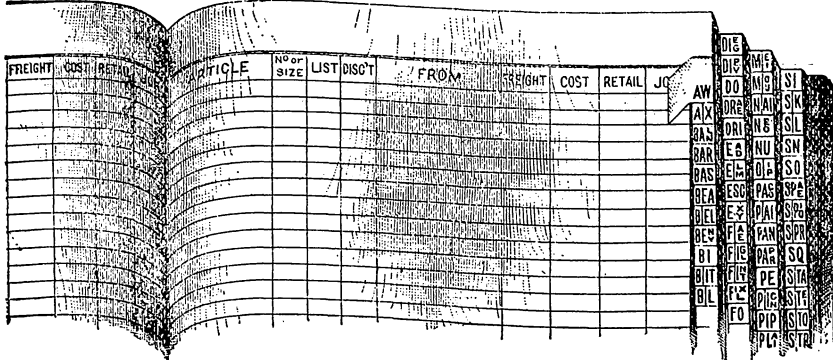
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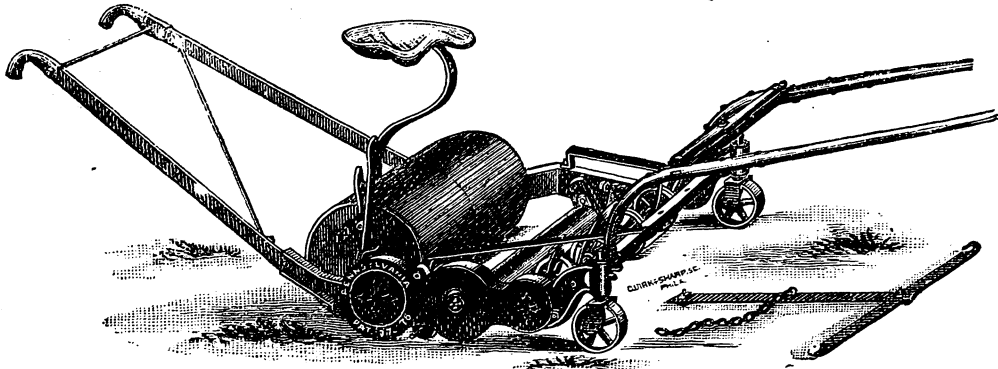
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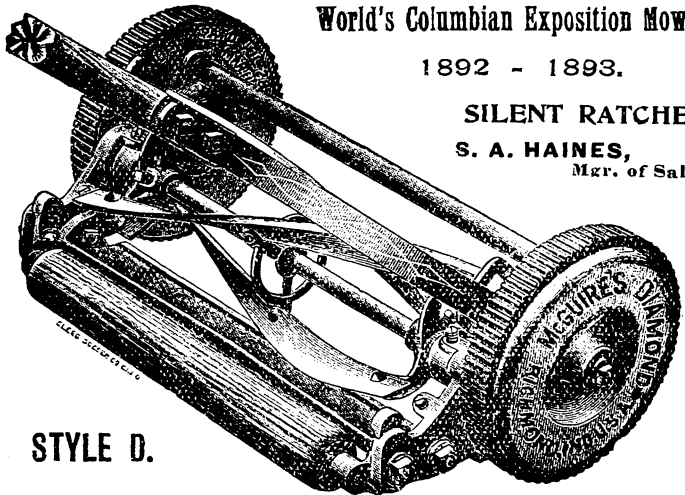
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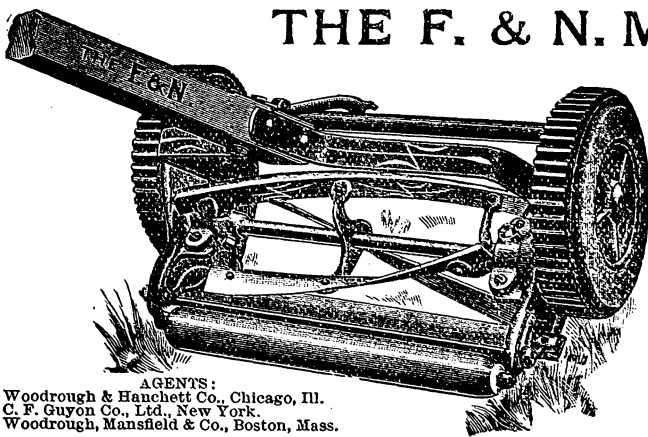
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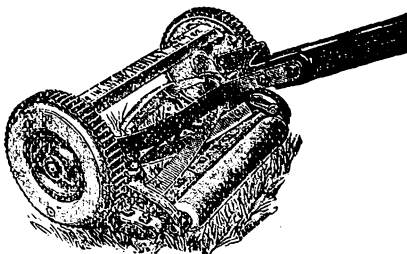
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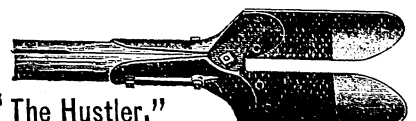
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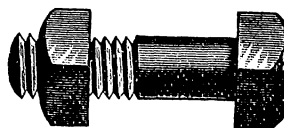
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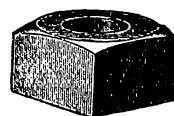
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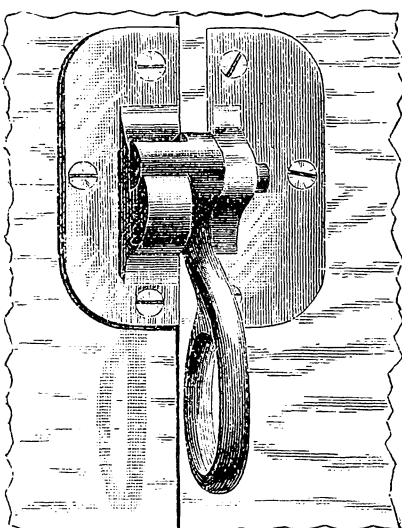
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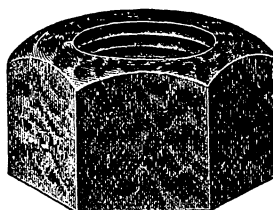
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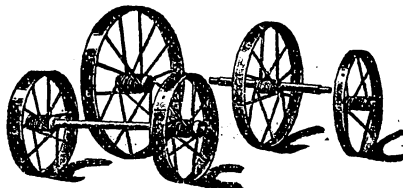
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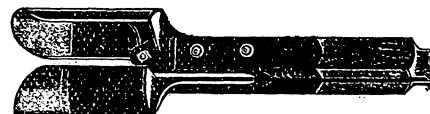
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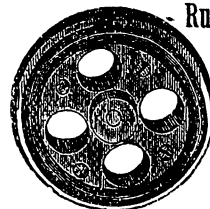
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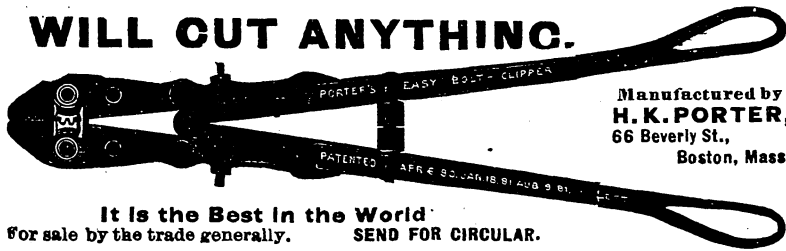
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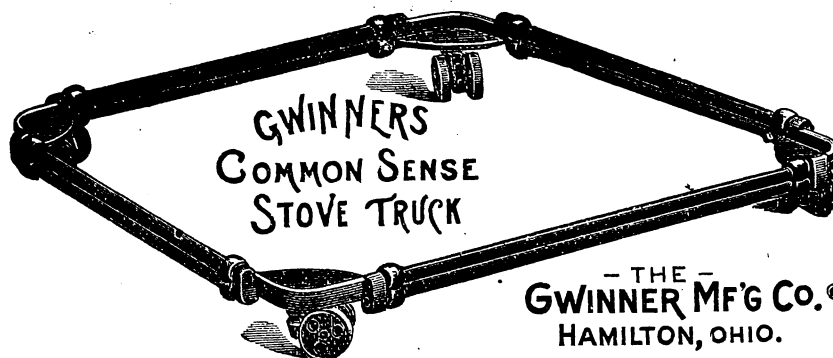
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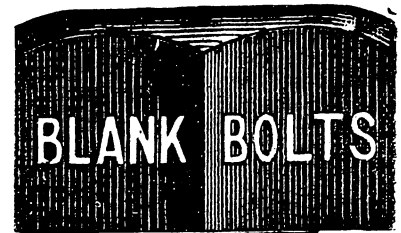
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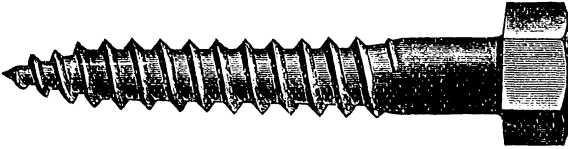
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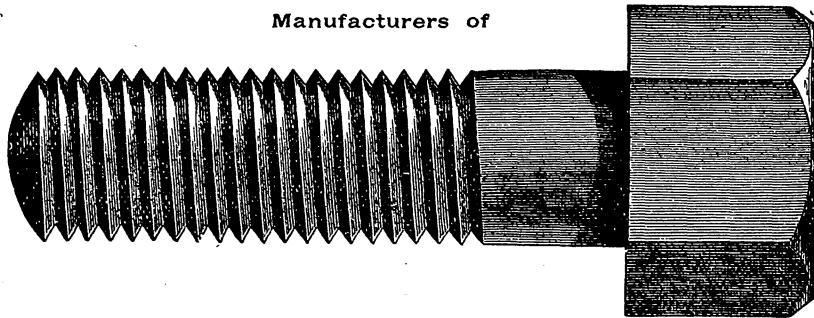
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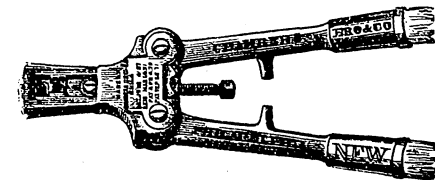


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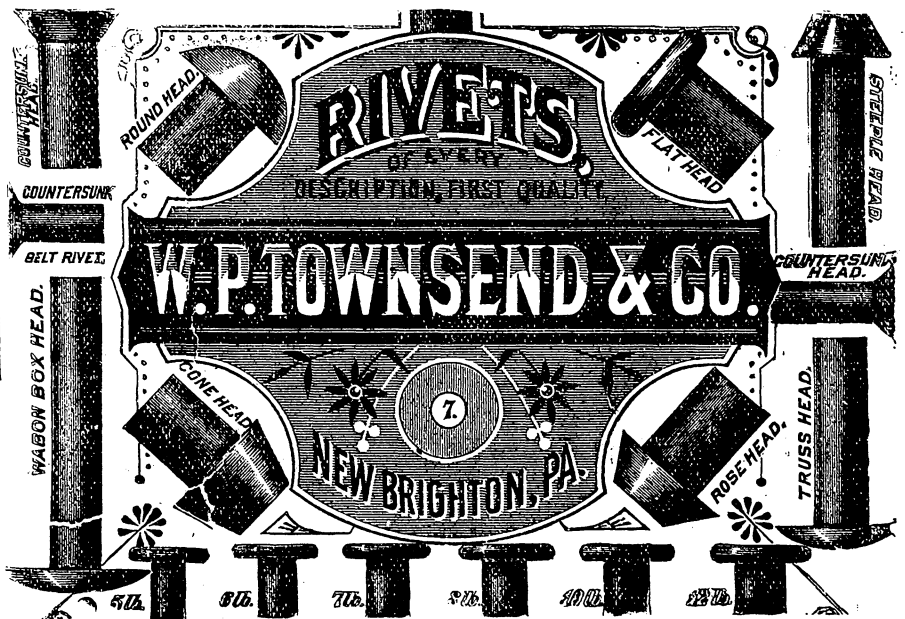
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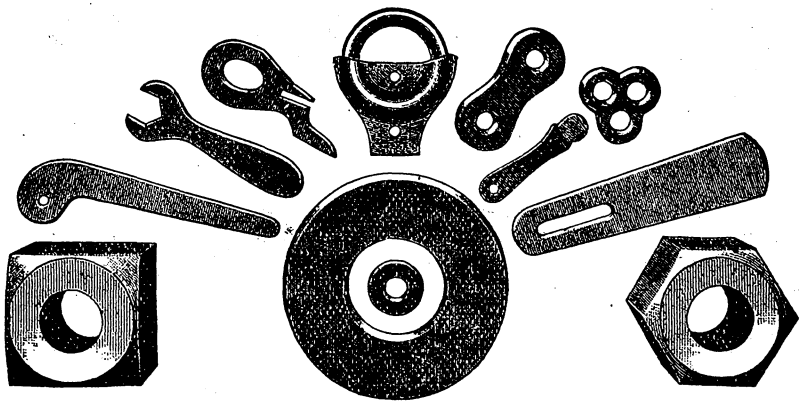
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Wiley & Russell Mfg. Co., Greenfield,  
Mass.

Woodward & Rogers, Hartford, Conn.

**Drop Forgings.**  
Billings & Spencer Co., Hartford, Conn.  
Boone, W. C. Mfg. Co., Boonton, N. J.  
Clapp, E. D. Mfg. Co., Auburn, N. Y.  
Eccles, Richard, Auburn, N. Y.  
Merrill Bros., Brooklyn, E. D.

Bliner & Peck Mfg. Co., New Haven, Ct.  
Phila. Drop Forge Co., Phila., Pa.  
Scranton Forging Co., Scranton, Pa.  
Williams, J. H. & Co., Brooklyn, N. Y.  
Wilmot & Hobbs Mfg. Co., Bridgeport,  
Conn.  
Wyman & Gordon, Worcester, Mass.

**Drop Presses.**  
Bliss, E. W. Co., Brooklyn, N. Y.

Crosby, G. A. & Co., Chicago, Ill.  
Ferracute Mch. Co., Bridgeton, N. J.  
Miner & Peck Mfg. Co., New Haven,  
Conn.

Stiles & Parker Press Co., Brooklyn,  
N. Y.

Vulcan Iron Works, Chicago, Ill.  
Waterbury Farrel Foundry and Ma-  
chine Co., Waterbury, Conn.

**Dumb Waiters.**  
Hutchinson, F. S. Co., 32 Warren Street,  
N. Y.

**Dynamite.**  
New York Powder Co., 62 Liberty St.,  
N. Y.

**Dynamics.**  
C. & C. Electric Co., 402 and 404  
Greenwich St., N. Y.

Zucker & Levett Chemical Co., 10 to  
14 Grand St., N. Y.

**Edge Tools, Makers of.**  
Amer. Axe & Tool Co., 280 B'way, N. Y.  
Buck Bros., Milbury, Mass.  
Buck, Chas., Milbury, Mass.  
Plumb, Layette R., Philadelphia, Pa.  
White, L. & I. J. Co., Buffalo, N. Y.

**Edging Shears.**  
Dille & McGuire Mfg. Co., Richmond,  
Ind.

See Alphabetical Index, Pages 118 & 120.

- Egg Beaters.**  
North Bros. Mfg. Co., Philadelphia, Pa.
- Electric Bells and Supplies.**  
Ostrander, W. R. & Co., 204 Fulton St., New York.  
Wollensak, J. F., Chicago, Ill.
- Electric Dynamo Machines.**  
Eddy Electric Mfg. Co., Windsor, Conn.  
Hanson & Van Winkle Co., Newark, N.J.
- Elevators, Makers of.**  
Link-Belt Engineering Co., Phila., Pa.  
Morse, Williams & Co., Phila., Pa.  
Penna. Elevator Engineering Co., Phila., Pa.  
Variety Machine Co., Warsaw, N. Y.  
Warner Elevator Mfg. Co., Cincinnati, Ohio.
- Emery and Emery Wheels.**  
N. Y. Belting & Packing Co., Ltd., N. Y.  
Northampton Emery Wheel Co., Leeds, Mass.  
Norton Emery Wheel Co., Worcester, Mass.  
Sterling Emery Wheel Co., 174 Fulton St., N. Y.  
Sturtevant Mill Co., Boston, Mass.
- Emery Wheel Dressers.**  
Bay State Stamping Co., Worcester, Mass.
- Engineers and Contractors.**  
Aiken, Henry, Pittsburgh, Pa.  
Artificial Gas Engineering Co., Pittsburgh, Pa.  
Herrick, J. A., 284 Pearl St., N. Y.  
Kennedy, Julian, Pittsburgh, Pa.  
Laughlin, Alex. & Co., Pittsburgh, Pa.  
Lean, D. R., Co., Pittsburgh, Pa.  
McClure, Amel & Co., Pittsburgh, Pa.  
Pittsburgh Iron & Steel Engineering Co., Pittsburgh, Pa.  
Smythe, S. R. Co., Incorporated, Pittsburgh, Pa.  
Swindell, W. & Bros., Pittsburgh, Pa.
- Engines, Gas and Gasoline.**  
Buckeye Mfg. Co., Union City, Ind.  
Otto Gas Engine Works, Phila., Pa.  
Rollason Gas Engine, Havemayer Bldg., N. Y.  
Springfield Gas Engine Co., Springfield, Ohio.
- Engines, Steam, Makers of.**  
Bass Foundry & Machine Works, Ft. Wayne, Ind.  
Chandler & Taylor Co., Indianapolis, Ind.  
Erie Engine Works, Erie, Pa.  
Lane & Bodley Co., Cincinnati, Ohio.  
Norwalk Iron Works Co., So. Norwalk, Conn.  
Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.  
Phila. Engineering Works, Phila., Pa.  
Southwark Foundry & Machine Co., Phila., Pa.  
Tod, William & Co., Youngstown, O.  
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.  
Wetherill, Robt. & Co., Chester, Pa.
- Exhaust Tumblers.**  
Sweetser, W. A., Brockton, Mass.
- Expansion Belts.**  
Boone, W. C. Mfg. Co., Boonton, N. J.  
Church, Isaac, Toledo, O.  
Steward & Romaine Mfg. Co., Phila., Pa.
- Exporters.**  
Flint & Co., 68 Broad St., N. Y.
- Faucets, Self-Measuring.**  
Lane Bros., Poughkeepsie, N. Y.
- Faucets, Wooden, Makers of.**  
John Sommer's Son, Newark, N. J.
- Feed-Water Heaters and Purifiers.**  
Davis, I. B. & Son, Hartford, Conn.  
Goubert Mfg. Co., 32 Cortlandt St., N. Y.  
Harrison Safety Boiler Works, Phila., Pa.  
National Pipe Bending Co., New Haven, Conn.  
Taunton Locomotive Mfg. Co., Taunton, Mass.  
Webster, Warren & Co., Camden, N. J.  
Whitlock Coil Pipe Co., Elmwood, Conn.
- Fencing, Iron and Wire.**  
Barnum, E. T., Detroit, Mich.  
Champion Iron Co., Kenton, O.  
Cleveland Fence Co., Indianapolis, Ind.  
Clinton Wire Cloth Co., Clinton, Mass.  
Gilbert & Bennett Mfg. Co., 42 Cliff St., Kilmer Mfg. Co., Newburgh, N. Y.  
McCallip Fence & Wire Wks., Columbus, Ohio.  
Randall Fence Co., Le Roy, N. Y.  
The Van Dorn Iron Works Co., Cleveland, O.  
Wire Fence Supply Co., Indianapolis, Ind.
- Files, Importers of.**  
Moss, F. W., 80 John St., N. Y.
- Files and Rasps, Manufacturers of.**  
Arcade File Works, Anderson, Ind.  
Banker & White, Troy, N. Y.  
Barnett, G. & H., 41 & 43 Richmond, Phila.  
McCartrey File Co., Philadelphia.  
Nicholson File Co., Providence, R. I.
- Fire Brick, Makers of.**  
Borgner, Cyrus, Philadelphia, Pa.  
Gardner, Jas. & Son, Cumberland, Md.  
Kreischer, B. & Sons, foot E. Houston St., N. Y.  
Maurer, H. & Son, 420 E. 23d, N. Y.  
Ostrander Fire Brick Co., Troy, N. Y.  
Valentine, M. D. & Bro., Woodbridge.
- Fire Doors.**  
Berlin Iron Bridge Co., E. Berlin, Conn.  
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
- Fishing Tackle.**  
Dane, Stoddard & Kendall, Boston, Mass.
- Flint and Emery Paper.**  
Baeder, Adamson & Co., Phila., Pa.
- Flour Sifters.**  
Bromwell Brush & Wire Goods Co., Cincinnati, Ohio.  
Meyers, Fred. J. Mfg. Co., Hamilton, O.
- Flue Cleaners.**  
Mackey, Jas. T., St. Louis, Mo.
- Fodder Cutters.**  
Silver Mfg. Co., Salem, O.
- Forges, Portable, &c.**  
Buffalo Forge Co., Buffalo, N. Y.  
Champion Blower & Forge Co., Lancaster, Pa.  
Foss Mfg. Co., Springfield, Ohio.  
Sturtevant, B. F. Co., Boston, Mass.
- Forgings, Iron and Steel.**  
Bethlehem Iron Co., S. Bethlehem, Pa.  
Cambria Steel-Cambria Iron Co., Johnstown, Pa.  
Frankford Steel Co., Phila., Pa.  
Scranton Forging Co., Scranton, Pa.  
U. S. Projectile Co., Brooklyn, N. Y.
- Forks, Hay and Manure.**  
Iowa Farming Tool Co., Ft. Madison, Iowa.
- Foundry Facings.**  
Dixon, Jos., Crucible Co., Jersey City, N. J.  
S. Obermayer Co., Cincinnati, O.  
Smith, J. D., Fdy. Supply Co., Cin., O.
- Foundry Kiddles.**  
Estey, W. S., 65 Fulton, N. Y.
- Foundry Supplies.**  
Diamond Clamp & Flask Co., Richmond, Ind.  
S. Obermayer Co., Cincinnati, O.  
Rice Mfg. Co., New Durham, N. H.  
Smith, J. D., Fdy. Supply Co., Cin., O.
- Friction Clutches.**  
Brown, A. & F., 17 Dey St., N. Y.  
Keystone Clutch & Mch. Wks., Phila., Pa.  
Moore & White Co., Philadelphia, Pa.
- Friction Cone.**  
Evans Friction Cone Co., Boston, Mass.
- Furnaces, Foundry.**  
Byram & Co., Detroit, Mich.
- Galvanized Material.**  
Jersey City Galvanizing Co., 112 John St., N. Y.
- Gas Producers.**  
Wood, R. D. & Co., Philadelphia, Pa.
- Garden Tools.**  
Dunlap, C. W., Box 2703, New York.
- Gas & Steam Fitters' Supplies.**  
Pancoast, Henry B. & Co., Phila., Pa.
- Gate Hinges.**  
Wrightsville Hdw. Co., Wrightsville, Pa.
- Gauge, Rolling Mill.**  
Haines Gauge Co., Philadelphia, Pa.
- Gear Cutters.**  
D. E. Whiton Mach. Co., New London, Conn.
- Gears.**  
Boston Gear Works, Boston, Mass.  
Lincoln Iron Works, Rutland, Vt.  
Poole, Robt. & Son Co., Baltimore, Md.  
U. S. Projectile Co., Brooklyn, N. Y.
- Glass Boards.**  
Canton Saw Co., Canton, O.
- Glass Cutters.**  
Monce, S. G., Bristol, Conn.
- Glue.**  
Baeder, Adamson & Co., Phila., Pa.  
Dodd, A. W. & Co., Gloucester, Mass.  
Russia Cement Co., Gloucester, Mass.
- Grass Carriers.**  
Glennon, J. & Co., Chicago, Ill.
- Grass Catchers.**  
Supplee Hardware Co., Phila., Pa.
- Grinding Mills.**  
Foss Mfg. Co., Springfield, O.
- Grinding and Polishing Machines.**  
Herrick & Cowell, New Haven, Conn.  
Norton Emery Wheel Co., Worcester, Mass.
- Grindstone Dressing Machinery.**  
Blake & Johnson, Waterbury, Conn.
- Grindstones.**  
Cleveland Stove Co., Cleveland, O.
- Gun Implements.**  
Union Hdw. Co., Torrington, Conn.
- Gunpowder, Makers of.**  
Lafin & Rand Powder Co., 29 Murray St., N. Y.
- Handles.**  
Cleveland Wood Turning Co., Cleveland, O.  
Piqua Handle & Mfg. Co., Piqua, Ohio.
- Hangers, Door.**  
Chicago Spring Butt Co., Chicago, Ill.  
Coburn Trolley Track Mfg. Co., Holyoke, Mass.  
Lane Bros., Poughkeepsie, N. Y.
- Hardware Comm'n Merchants.**  
Graham, John H. & Co., 111 Chambers St., New York.  
Jacobus, W. H., 90 Chambers, N. Y.
- Hardware Manufacturers.**  
Dunlap, C. W., Box 2703, New York.  
Russell & Erwin Mfg. Co., Chambers St., New York.  
Stearns, E. C. & Co., Syracuse, N. Y.  
Streeter, N. R. & Co., Groton, N. Y.  
Union Mfg. Co., 103 Chambers, N. Y.  
Yale & Towne Mfg. Co., Stamford, Conn.
- Hardware Mfrs.' Agents.**  
Bingham, W. Co., Cleveland, O.  
Clarke, Thomas, St. John, N. B.  
Graham, John H. & Co., 113 Chambers.  
Sickles, Sweet & Lyon, 35 Barclay, N. Y.
- Hardware Specialties.**  
Acme Shear Co., Bridgeport, Conn.  
Berger Bros., Philadelphia, Pa.  
Bourke Mfg. Co., Youngstown, O.  
Clark Mfg. Co., Buffalo, N. Y.  
Enterprise Mfg. Co., Philadelphia, Pa.  
Ette & Henger Mfg. Co., St. Louis, Mo.  
Gwiner Mfg. Co., Hamilton, O.  
Haines & Zimmerman, Phila., Pa.  
Johnson, S. C., Racine, Wis.
- North Bros. Mfg. Co., Philadelphia, Pa.**  
Ransom Hdw. Co., Burlington, Vt.  
Scranton & Co., New Haven, Conn.  
Wilson, J. Fred., Worcester, Mass.  
Wrightsville Hdw. Co., Wrightsville, Pa.
- Harness Snaps.**  
Covert Mfg. Co., West Troy, N. Y.  
Coverts' Saddlery Wks., Farmer, N. Y.  
Fitch, W. & E. T., New Haven, Conn.
- Hog Rings and Ringers.**  
Oakes & Irwin, Decatur, Ill.
- Hoisting Machines.**  
Box, Alfred & Co., 314 Green, Phila.  
Brown Hoisting & Conveying Mch. Co., Cleveland, Ohio.  
Fulton Iron & Engine Wks., Detroit, Mich.  
Harrington, E. Son & Co., Phila.  
Lane Bros., Poughkeepsie, N. Y.  
Lidgerwood Mfg. Co., 96 Liberty, N. Y.  
Lincoln Iron Works, Rutland, Vt.  
McCoy, Jos. F. & Co., 20 Warren St.  
Maris & Beekley, Philadelphia.  
Moore Mfg. & Fdy. Co., Milwaukee, Wis.  
Morse, Williams & Co., Phila.  
Sellers, Wm. & Co., Phila. and N. Y.  
Speldel, J. G., Reading, Pa.  
Yale & Towne Mfg. Co., Stamford, Ct.
- Hollow Ware.**  
Avery Stamping Co., Cleveland, O.  
Bronson Supply Co., Cleveland, Ohio.  
Cleveland Stamping & Tool Co., Cleveland, O.  
Stuart & Peterson Co., Phila., Pa.
- Horse Nails, Makers of.**  
Capewell Horse Nail Co., Hartford, Conn.  
National Horse Nail Co., Vergennes, Vt.  
Putnam Nail Co., Neponset, Boston, Mass.
- Horse and Mule Shoes, Makers of.**  
Bryden Horse Shoe Co., Catsaqua, Pa.  
Burden Iron Co., Troy, N. Y.  
Crescent Horse Shoe & Iron Co., Max Meadows, Va.  
Diamond State Iron Co., Wilmington, Del.  
Old Dominion Iron & Nail Works Co., Richmond, Va.  
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.  
Rhodes Island Perkins Horse Shoe Co., Providence.  
Shoenberger & Co., Pittsburgh, Pa.  
Standard Horse Shoe Co., Boston, Mass.
- Hose Menders.**  
Hudson, C. E. & Co., Leominster, Mass.  
Jones, M. D. & Co., Boston, Mass.
- Hose.**  
Cleveland Rubber Works, Cleveland, O.  
N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.
- Hydrants, &c.**  
McLean, John, 296 & 298 Monroe, N. Y.
- Hydraulic Forging.**  
U. S. Projectile Co., Brooklyn, N. Y.
- Hydraulic Jacks.**  
Dudgeon, Richard, 24 Columbia, N. Y.  
McCoy, Jos. F. Co., 26 Warren St., N. Y.
- Ice Cream Freezers.**  
North Bros. Mfg. Co., Phila., Pa.  
Packer, C. W., Philadelphia, Pa.  
White Mountain Freezer Co., Nashua, N. H.
- Injectors.**  
Eynon-Evans Mfg. Co., Philadelphia, Pa.  
Jenkins Bros., New York.  
Sherwood Mfg. Co., Buffalo, N. Y.
- Insurance, Boiler.**  
Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.
- Iron and Steel, Swedish.**  
Lundberg, Gustaf, Boston, Mass.  
Milne, A. & Co., 1 Broadway, N. Y.
- Iron Commission Brokers.**  
Butze, Adolph, St. Louis, Mo.  
Corning, Edw. & Co., 29 B'way, N. Y.  
Cotton, Barclay W. & Co., Phila.  
Etting, Edw. J., Philadelphia.  
Hogan, John L. & Co., Philadelphia, Pa.  
Hoffman, J. W. & Co., Philadelphia.  
Levis, Henry & Co., Philadelphia.  
Keeley, Jerome & Co., Philadelphia.  
Lee, J. Tatnall & Co., Philadelphia.  
Mohr, J. J., 430 Walnut, Philadelphia.  
Pilling & Crane, Philadelphia, Pa.  
Wister, L. & R. & Co., Phila., Pa.
- Iron Ore.**  
Samuel, Frank, Philadelphia, Pa.
- Iron Merchants.**  
Barns, C. K. & Co., Philadelphia, Pa.  
Borden & Lovell, West, Ill.  
Eussenius & Cumfitt, Philadelphia.  
Corning, Edw. & Co., 29 B'way, N. Y.  
Cox, Justice, Jr., Philadelphia.  
Cotton, Barclay W. & Co., Phila.  
Hoffman, J. W. & Co., Philadelphia.  
Leonard, J., 446 West St., N. Y.  
Nicolls, Wheeler & Co., Philadelphia.  
Ogden & Wallace, 577 to 583 Greenwich St., N. Y.  
Pierson & Co., 29 Broadway, N. Y.  
Thomson, W. H. & Co., Phila., Pa.  
Wallace, Wm. H. & Co., 66 B'way, N. Y.  
Whitney, A. R. & Co., 17 B'way, N. Y.  
Wilson, E. H. & Co., Philadelphia.
- Iron, Importers.**  
Abbott, Wheelock & Co., N. Y. and Boston.  
Lundberg, Gustaf, Boston, Mass.
- Iron Sheet, Manufacturers of.**  
Cambridge Iron & Steel Co., Cambridge, Ohio.  
W. Dewees Wood Co., Ltd., McKeesport, Pa.
- Ironwork, Ornamental.**  
Barnum, E. T., Detroit, Mich.  
Champion Iron Co., Kenton, O.  
Ludlow-Saylor Wire Co., St. Louis, Mo.  
The Van Dorn Iron Works Co., Cleveland, O.
- Keys.**  
Wollensak, J. F., Chicago, Ill.
- Ladles.**  
Detroit Fdy. Equipment Co., Detroit, Mich.
- Lamps.**  
Standard Lighting Co., Cleveland, O.
- Lanterns.**  
Rochester Lamp Co., 42 Park Place, New York.  
Steam Gauge & Lantern Co., Syracuse, N. Y.
- Lathes.**  
Dietz, Schumacher & Co., Cincinnati, O.  
Draper Machine Tool Co., Worcester, Mass.  
Harrington, E. Son & Co., Phila., Pa.  
Johnson, Israel H., Jr. & Co., Philadelphia, Pa.  
New Haven Mfg. Co., New Haven, Conn.  
Sebastian Lath Co., Cincinnati, O.  
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Lathing, Wire.**  
Clinton Wire Cloth Co., Clinton, Mass.  
N. J. Wire Cloth Co., Trenton, N. J.  
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Laundry Machines.**  
Johnson, S. C., Racine, Wis.
- Lawn Mowers.**  
Anderson, F. S. & Co., Richmond, Ind.  
Blair Mfg. Co., Springfield, Mass.  
Chadborn & Coldwell Mfg. Co., Newburg, N. Y.  
Coldwell Lawn Mower Co., Newburg, N. Y.  
Dille & McGuire Mfg. Co., Richmond, Ind.  
Enterprise Mfg. Co., Philadelphia, Pa.  
F. & N. Mfg. Co., Richmond, Ind.  
Henley, M. C., Richmond, Ind.  
Supplee Hdw. Co., Phila., Pa.
- Lawn Rakes.**  
Gibbs Mfg. Co., Canton, Ohio.  
Kohler, F. E. & Co., Canton, O.
- Lawn Sprinklers.**  
Blair Mfg. Co., Springfield, Mass.  
Enterprise Mfg. Co., Phila., Pa.  
Ette & Henger Mfg. Co., St. Louis, Mo.  
Gibbs Mfg. Co., Canton, Ohio.  
Graham, John H. & Co., 113 Chambers Street, N. Y.  
McGowan, John H. Co., Cincinnati, O.  
Portland Lawn Sprinkler Co., Portland, Me.
- Lemon Squeezers.**  
Ripley Mfg. Co., Unionville, Conn.
- Letters and Figures, Metallic.**  
White, A. A. & Co., Providence, R. I.
- Letters, Paper.**  
Tablet & Ticket Co., Chicago, Ill.
- Levels.**  
Richardson, C. F. & Son, Athol, Mass.
- Locks and Knobs, Manufacturers of.**  
Dietz, A. E., 97 Chambers, N. Y.  
Independent Electric Co., Chicago, Ill.  
Reading Hdw. Co., Reading, Pa.  
Romer & Co., Newark, N. J.  
Smith & Egge Mfg. Co., Bridgeport, Conn.  
Yale & Towne Mfg. Co., Stamford, Conn.
- Lubricants.**  
Dixon, Jos., Crucible Co., Jersey City, N. J.
- Machinery.**  
Am. Tool Works, Cleveland, Ohio.  
Ayer, H. C. & Gleason Co., Phila., Pa.  
Barnes, W. F. & John, Rockford, Ill.  
Bement, Miles & Co., Philadelphia, Pa.  
Bigelow, C. E., 45 De N. Y.  
Bisnall & Keeler Mfg. Co., St. Louis.  
Bliss, E. W. Co., Brooklyn, N. Y.  
Bridgeport Mch. Tool Works, Bridgeport, Conn.  
Briggs, Marvin, 12 Broadway, N. Y.  
Carlin's Sons, Thos., Allegheny, Pa.  
Clapp, Geo. M., agt., 74 Cortlandt, N. Y.  
Detrick & Harvey Mch. Co., Baltimore, Md.  
Dietz, Schumacher & Co., Cincinnati, Ohio.  
Fitchburg Mch. Works, Fitchburg, Mass.  
Garvin Mch. Co., Laight & Canal Sts.  
Gould & Eberhardt, Newark, N. J.  
Hamilton Mch. Tool Co., Hamilton, O.  
Harrington, E. Son & Co., Phila., Pa.  
Henderer, A. L., Wilmington, Del.  
Hendey Machine Co., Torrington, Ct.  
Hill, Clarke & Co., Boston, Mass.  
Howard & Morse, 45 Fulton St., N. Y.  
Hubert-Rogers Mch. Co., South Sudbury, Mass.  
Johnson, Israel H., Jr. & Co., Phila.  
Jones & Y. Y. & Lamson Mch. Co., Springfield, Vt.  
Lodge & Davis Mch. Tool Co., Cincinnati, O.  
Lodge & Shipley Mch. Tool Co., Cincinnati, O.  
McGregor & Co., Philadelphia, Pa.  
McCabe, J. J., 68 Cortlandt, N. Y.  
Machinery Supply Co., Rochester, N. Y.  
Manville, E. J., Mch. Co., Waterbury, Conn.  
Newark Mch. Tool Wks., Newark, N. J.  
New Haven Mfg. Co., New Haven, Ct.  
New York Machinery Depot, 178 Broadway, New York.  
Niles Tool Wks., 138 Liberty St., N. Y.  
Pitkin, A. B. Machinery Co., Providence, R. I.  
Pittsburgh Mfg. Co., Pittsburgh, Pa.

Place, Geo., 145 Broadway, N. Y.  
 Poole, Robt. & Son Co., Baltimore, Md.  
 Powell Planer Co., Worcester, Mass.  
 Pratt & Whitney Co., Hartford, Conn.  
 Prentiss Tool & Supply Co., N. Y.  
 Scranton Supply & Mchry. Co., Scranton, Pa.  
 Sellers, Wm. & Co., Phila.  
 Seyfert's Sons, L. F., Philadelphia, Pa.  
 Sigourney Tool Co., Hartford, Conn.  
 Steptoe, J. & Co., Cincinnati, O.  
 Stow Flexible Shaft Co., Ltd., Phila.  
 Toomey, Frank, Philadelphia, Pa.  
 Wetherill, Robert & Co., Chester, Pa.  
 Wickes Bros., Saginaw, Mich.  
 Wilson, W. A., Rochester, N. Y.

**Machinery for Hardware Manufacturers.**  
 Adt, Jno. & Son, New Haven, Conn.

**Machine Knives.**  
 Loring, Coes & Co., Worcester, Mass.  
 Loyd, John, 658-662 Water St., N. Y.  
 Simonds Mfg. Co., Fitchburg, Mass.  
 New Britain Hdw. Mfg. Co., New Britain, Conn.

**Machine Tools.—See Machinery.**

**Machine Work.**  
 Papping, J., 68th St. & 11th Ave., N. Y. City.

**Machinists' Scales.**  
 Coffin & Leighton, Syracuse, N. Y.  
 Starratt, L. S., Athol, Mass.

**Machinists' Tools and Supplies.**  
 King, J. M. & Co., Waterbury, N. Y.  
 Sellers, Wm. & Co., Inc., Phila.

**Mangles.**  
 Johnson, S. C., Racine, Wis.

**Manufacturing Sites.**  
 Illinois Central R. R., Chicago, Ill.

**Measuring Tapes.**  
 Keuffel & Esser Co., N. Y.  
 Lufkin Rule Co., Saginaw, Mich.

**Meat Choppers.**  
 Clauss Shear Co., Fremont, Ohio.

**Mechanical Instruction.**  
 Correspondence School of Mechanics, Scranton, Pa.  
 Rose Polytechnic Institute, Terre Haute, Ind.

**Metals.**  
 Fearing, Wm. S., 100 Chambers, N. Y.  
 Hendricks Bros., 49 Cliff, N. Y.

**Metal Brokers.**  
 American Metal Co., N. Y.

**Metallic Ceilings.**  
 Penn Iron Roofing & Corrugating Co., Phila., Pa.

**Metallurgists.**  
 Britton, J. Blodgett, Phila., Pa.

**Mining Knives.**  
 Palmer Hdw. Mfg. Co., Troy, N. Y.

**Mine Lamps.**  
 Darby, Edw. & Sons, Phila., Pa.  
 Leonard, B. E., Scranton, Pa.

**Mining Screens.**  
 Harrington & King Perforating Co., Chicago, Ill.  
 Howard & Morse, 45 Fulton, N. Y.

**Models, Makers of.**  
 Franklin, H. H. Mfg. Co., Syracuse, N. Y.  
 Ideal Machine Works, Hartford, Conn.

**Molding Sand.**  
 Obermayer, S. Co., Cincinnati, O.

**Money Drawers.**  
 Waddell Wooden Ware Wks., Greenfield, Ohio.  
 Sun Mfg. Co., Greenfield, Ohio.

**Motors, Water and Electric.**  
 Boigiano Mfg. Co., Baltimore, Md.  
 C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.  
 Dallett, Thomas H. & Co., Phila., Pa.

**Nail Keg Stock.**  
 Crescent Mfg. Co., Detroit Mich.

**Nail Machinery.**  
 Pittsburgh Mfg. Co., Pittsburgh, Pa.

**Nail and Tack Pullers.**  
 Scranton & Co., New Haven, Conn.  
 Specialty Mfg. Co., Hartford, Conn.

**Nails (Cut) and Spikes.**  
 Borden & Lovell, 70 West, N. Y.  
 Cumberland Nail & Iron Co., Phila.  
 Pottstown Iron Co., Pottstown, Pa.  
 Riverside Iron Wks., Wheeling, W. Va.  
 Valley Steel Co., St. Louis, Mo.

**Nickel Platers' Supplies.**  
 Eddy Electric Mfg. Co., Windsor, Conn.  
 Hanson & Van Winkle Co., Newark, N. J.  
 Zucker & Levett Chemical Co., 10 to 14 Grand St., N. Y.

**Nickel Plating.**  
 Rhodes, L. E. Co., Hartford, Conn.

**Norway Shapes, Rollers of.**  
 Rowland, William & Harvey, Frankford, Philadelphia.

**Novelty Manufacturers.**  
 Franklin, H. H. Mfg., Syracuse, N. Y.  
 Ideal Machine Works, Hartford, Conn.

**Nut Machines.**  
 Dunham Nut Co., Unionville, Ct.

**Nuts, Bolts, & Co., Makers of.**  
 American Bolt Co., Lowell, Mass.  
 American Screw Co., Providence, R. I.  
 Blake & Johnson, Waterbury, Conn.  
 Dunham Nut Co., Unionville, Conn.  
 Haskell, Wm. H. Co., Pawtucket, R. I.  
 Mt. Carmel Bolt Co., Mt. Carmel, Conn.  
 Pennsylvania Bolt & Nut Co., Lebanon, Pa.  
 Port Chester Bolt & Nut Co., Port Chester, N. Y.  
 Russell, Burdall & Ward, Port Chester, N. Y.  
 Sternbergh, J. H. & Son, Reading, Pa.  
 Wilson, J. Fred., Worcester, Mass.  
 Wm. H. Haskell Co., Pawtucket, R. I.

**Oil Cups and Lubricators.**  
 Sherwood Mfg. Co., Buffalo, N. Y.

**Oilers.**  
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Oil Stones.**  
 Pike Mfg. Co., Pike Station, N. H.

**Orange Shears.**  
 Henry, J. T. Mfg. Co., Hamden, Conn.

**Ores.**  
 Wister, Francis, Philadelphia, Pa.

**Ox Shoes.**  
 Scranton Forging Co., Scranton, Pa.

**Packing.**  
 Morrison, Robert, St. Louis, Mo.  
 N. Y. Belting & Packing Co., Ltd., N. Y.

**Padlocks.**  
 Ames Sword Co., Chicopee, Mass.  
 Frahm, E. T., Lancaster, Pa.  
 Independent Electric Co., Chicago, Ill.  
 Shultz Mfg. Co., Phila., Pa.  
 Wolf, W. & L., Phila., Pa.

**Paint.**  
 Garry Iron & Steel Roofing Co., Cleveland, O.

**Paint Burners.**  
 Dangler Stove & Mfg. Co., Cleveland, Ohio.

**Paint Cans.**  
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Pants Stretcher.**  
 Covert Mfg. Co., West Troy, N. Y.

**Patent Solicitors.**  
 Butler, C. N., Phila., Pa.  
 Jenner, H. W. T., Washington, D. C.  
 Howson & Howson, Philadelphia and Washington.  
 Stocking, E. B., Washington, D. C.

**Pattern Letters.**  
 Wells, Heber, 157 William St., N. Y.

**Perforated Metal.**  
 Clinton Wire Cloth Co., Clinton, Mass.  
 Harrington & King Perforating Co., Chicago, Ill.  
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.

**Phosphor Bronze.**  
 Phosphor Bronze Smelting Co., Limited, Philadelphia.

**Phosphor Tin.**  
 Crescent Phosphorized Metal Co., Philadelphia, Pa.  
 Halk & Naumann, 516 Pearl, N. Y.

**Picks and Mattocks.**  
 Plumb, Fayette R., Philadelphia, Pa.

**Pig Iron.**  
 Houston, C. B. & Co., Philadelphia, Pa.  
 Montour Iron & Steel Co., Danville, Pa.  
 Naylor & Co., 45 Wall, N. Y.  
 Filling & Crane, Philadelphia, Pa.  
 Samuel, Frank, Philadelphia, Pa.

**Pig Iron Storage.**  
 Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.

**Pile Drivers.**  
 Vulcan Iron Works, Chicago, Ill.

**Pipe, Bent.**  
 National Pipe Bending Co., New Haven, Conn.

**Pipe Cutting and Threading Machines.**  
 Armstrong Mfg. Co., Bridgeport, Conn.  
 Bignall & Keeler Mfg. Co., St. Louis, Mo.  
 Detrick & Harvey Mch. Co., Baltimore, Md.  
 Merrill Mfg. Co., Toledo, O.  
 Pancoast, Henry B. & Co., Phila.  
 Saunders' Sons, D., Yonkers, N. Y.  
 Walworth Mfg. Co., Boston, Mass.

**Pipe Grips.**  
 Prentiss Vise Co., 44 Barclay, N. Y.

**Pipes, Fittings, &c., Makers of.**  
 McNab & Harlin Mfg. Co., N. Y.

**Pipe, Water and Gas, Makers of.**  
 Cumberland Nail & Iron Co., Phila., Pa.  
 Donaldson Iron Co., Emmaus, Pa.  
 Riverside Iron Works, Wheeling, W. Va.  
 Wood, R. D. & Co., Philadelphia, Pa.

**Plane Irons, Manufacturers of.**  
 Buck Bros., Millbury, Mass.  
 Buck, Chas., Millbury, Mass.

**Planers.**  
 Detrick & Harvey Mch. Co., Baltimore, Md.  
 New Haven Mfg. Co., New Haven, Conn.  
 Powell Planer Co., Worcester, Mass.  
 Wilson, W. A., Worcester, Mass.

**Planes, Manufacturers of.**  
 Stanley Rule & Level Co., N. Y.

**Plated Ware.**  
 Boardman, L. & Son, New Haddam, Ct.  
 Holmes & Edwards Silver Co., Bridgeport, Conn.  
 Rogers, Wm. Mfg. Co., Hartford, Ct.

**Plate, Iron and Steel, Mfrs. of.**  
 Elma-Standard Iron & Steel Co., Bridgeport, O.  
 Lukens Iron & Steel Co., Coatesville, Pa.  
 Mahoning Valley Iron Co., Youngstown, Ohio.  
 McBeth-McLean Co., Pittsburgh, Pa.  
 McIlvain & Sons, Reading, Pa.  
 Pottstown Iron Co., Pottstown, Pa.  
 Pottsville Iron & Steel Co., Pottsville, Pa.  
 Singer, Nivalck & Co., Pittsburgh, Pa.  
 The Mahoning Valley Iron Co., Youngstown, O.  
 Wood, Alan Co., Philadelphia.

**Plating, Nickel, Brass and Silver.**  
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Polishing Machines.**  
 Watson & Stillman, 204 E. 43d, N. Y.

**Post Hole Diggers.**  
 Gibbs Mfg. Co., Canton, Ohio.  
 Kohler, F. E. & Co., Canton, O.

**Poultry Nettings.**  
 Barnum, E. T., Detroit, Mich.  
 Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.  
 N. J. Wire Cloth Co., Trenton, N. J.  
 "Silver Finish."  
 Tyler Wire Works Co., W. S., Cleveland, O.  
 Wright & Colton Wire Cloth Co., Worcester, Mass.

**Powder.**  
 Laffin & Rand Powder Co., 29 Murray, New York Powder Co., 62 Liberty St., N. Y.

**Power Hack Saws.**  
 Millers Falls Co., 93 Reade St., N. Y.

**Power Hammers.**  
 Diebolt & Eisenhardt, Philadelphia.  
 Duport Mfg. Co., St. Johnsbury, Vt.  
 Jenkins & Ling, Bellefonte, Pa.  
 Scranton & Co., New Haven, Conn.

**Power Transmitting Machinery.**  
 Dodge Mfg. Co., Mishawaka, Ind.

**Presses, Dies, &c.**  
 E. W. Bliss Co., Brooklyn, N. Y.  
 Crosby, G. A. & Co., Chicago, Ill.  
 Ferracute Mch. Co., Bridgeport, N. J.  
 Stark Mch. & Tool Co., Buffalo, N. Y.  
 Stiles & Parker Press Co., Brooklyn, N. Y.  
 Waterbury Mch. Co., Waterbury, Ct.

**Presses, Power, Makers of.**  
 Bliss, E. W. Co., Brooklyn, N. Y.  
 Manville, E. J. Mch. Co., Waterbury, Ct.  
 Stark Mch. & Tool Co., Buffalo, N. Y.  
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

**Pulleys.**  
 Brown, A. & F., 17 Dey St., N. Y.  
 Dodge Mfg. Co., Mishawaka, Ind.  
 Keystone Clutch Mch. Wks., Phila., Pa.  
 Lake, J. H. & D. Co., Massillon, O.  
 Reeves Pulley Co., Columbus, Ind.

**Pulverizing Mills.**  
 Bradley Fertilizer Co., Boston, Mass.

**Pumping Machinery.**  
 Dean Bros. Steam Pump Works, Indianapolis, Ind.  
 Hooker-Corville Steam Pump Co., St. Louis, Mo.  
 Lucas, C. O. & Co., Greenville, Ohio.  
 McGowan, J. H. & Co., Cincinnati, O.  
 Maslin, J. & Son, Jersey City, N. J.  
 Norwalk Iron Works Co., So. Norwalk, Conn.  
 Newark Fdy. & Mch. Co., Phila., Pa.  
 Valley Pump Works, Easthampton, Mass.  
 Worthington, Henry R., 86 and 88 Liberty St., N. Y.

**Pumps, Makers of.**  
 Bellevue Pump Co., Bellevue, Iowa.  
 Deming Co., Salem, O.  
 Douglas, W. & B., Middletown, Conn.  
 Myers, F. E. & Bro., Ashland, O.

**Punches.**  
 Richards, I. P., Providence, R. I.

**Punches and Shears, Hand and Power.**  
 Bertsch & Co., Cambridge City, Ind.  
 E. W. Bliss Co., Brooklyn, N. Y.  
 Crosby, G. A. & Co., Chicago, Ill.  
 Ferracute Mch. Co., Bridgeport, N. J.  
 Henderson, A. L., Wilmington, Del.  
 Stark Mch. & Tool Co., Buffalo, N. Y.  
 Stiles & Parker Press Co., Brooklyn, N. Y.  
 Wais & Roos Punch & Shear Co., Cincinnati, Ohio.  
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.  
 Watson & Stillman, 204 E. 43d, N. Y.

**Rails, Old and New.**  
 Perry, W. H. & Co., Providence, R. I.

**Rat and Mouse Traps.**  
 Estey, W. S., 65 Fulton, N. Y.  
 Ripley Mfg. Co., Unionville, Conn.  
 Sun Mfg. Co., Greenfield, Ohio.

**Razor Guard.**  
 Murphy, P. D., Lockport, N. Y.

**Razor Sharpener.**  
 Razorine Mfg. Co., 2 W. 14th St., N. Y.

**Razor Strops.**  
 Torrey J. R. & Co., Worcester, Mass.

**Reels.**  
 Hendryx, A. B. Co., New Haven, Conn.

**Refrigerator Door Fasteners.**  
 Conroy, P. J. & Co., Philadelphia.

**Refrigerators.**  
 Monroe Refrigerator Co., Lockland, O.

**Rivets.**  
 Blake & Johnson, Waterbury, Conn.  
 Boyce Rivet Co., Muncie, Ind.  
 Burden Iron Co., Troy, N. Y.  
 Clark & Cowles, Plainville, Conn.  
 Cobb & Drew, Plymouth, Mass.  
 New England Screw Co., Boston, Mass.  
 Sternbergh, J. H. & Son, Reading, Pa.  
 Townsend, W. P. & Co., New Brighton, Pa.

**Riveting Machines.**  
 Adt, Jno. & Sons, New Haven, Conn.

**Rolling Mill Machinery.**  
 Birmingham Iron F'dry, Birmingham, Conn.  
 Booth, The Lloyd Co., Youngstown, O.  
 Leechburg Foundry & Mch. Co., Pittsburgh, Pa.  
 Morgan Construction Co., Worcester, Mass.  
 Robinson-Rea Mfg. Co., Pittsburgh.  
 Totten & Hogg Iron and Steel F'dry Co., Pittsburgh, Pa.  
 Trethewey Mfg. Co., Pittsburgh, Pa.  
 Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.

**Rolls, Chilled, Sand and Steel.**  
 Birmingham Iron Foundry, Birmingham, Conn.

**Booth, The Lloyd Co., Youngstown, O.**  
 East Chicago F'dry Co., Chicago, Ill.  
 Garrison, A. F'dry Co., Pittsburgh, Pa.  
 Robinson-Rea Mfg. Co., Pittsburgh, Pa.  
 Seaman, Sleeth & Black, Pittsburgh.  
 Totten & Hogg Iron and Steel F'dry Co., Pittsburgh, Pa.

**Roofing.**  
 Berlin Iron Bridge Co., E. Berlin, Conn.  
 Cambridge Roofing Co., Cambridge, O.  
 Cincinnati Corrugating Co., Piqua, O.  
 Kanenberg Roofing Co., Canton, O.  
 N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.

**Rope and Web Goods.**  
 Covert Mfg. Co., West Troy, N. Y.  
 Covert's Saddlery Wks., Farmer, N. Y.

**Rope Wheels.**  
 Cresson, Geo. V. Co., Philadelphia, Pa.

**Rubber Goods.**  
 Canfield, H. O., Bridgeport, Conn.

**Rules, Manufacturers of.**  
 Keuffel & Esser Co., New York.  
 Lufkin Rule Co., Saginaw, Mich.  
 Stanley Rule & Level Co., 29 Chambers.

**Rust Preventive.**  
 Bridgeport Gun Implement Co., 313-3.5 Broadway, N. Y.

**Sad Irons.**  
 Streeter, N. R. & Co., Groton, N. Y.

**Sad Irons, Gas.**  
 Boigiano Mfg. Co., Baltimore, Md.

**Sample Holder.**  
 Massey & Thompson, Monroe City, Mo.

**Sand Paper.**  
 Baeder, Adamson & Co., Phila., Pa.

**Sash Balances.**  
 Caldwell Mfg. Co., Rochester, N. Y.  
 Pullman Sash Balance Co., Rochester, N. Y.  
 Stearns, E. C. & Co., Syracuse, N. Y.

**Sash Cords and Chains.**  
 Morton, Thos., #5 Elizabeth, N. Y.  
 Ossawan Mills Co., Norwich, Conn.  
 Samson Cordage Works, Boston, Mass.  
 Smith & Egge Mfg. Co., Bridgeport.

**Sash Fasteners.**  
 Wooster, F. V., Boston, Mass.

**Sash Locks.**  
 Columbian Sash & Door Lock Co., Wauseon, Ohio.

**Sash Pulleys.**  
 Palmer Hardware Mfg. Co., Troy, N. Y.

**Sash Weights.**  
 Brown, E. B. & Co., Philadelphia, Pa.  
 Norton Bros., Chicago, Ill.

**Saw Filing Machines.**  
 Disston, Henry & Sons, Philadelphia, Pa.

**Saws, Makers of.**  
 Butler Mfg. Co., Boston, Mass.  
 Disston, Henry & Sons, Phila., Pa.  
 National Saw Co., 86 Reade St., N. Y.  
 Simonds Mfg. Co., Fitchburg, Mass.

**Saw Vises.**  
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.

**Saw Sets.**  
 Taintor Mfg. Co., 84-86 Chambers, N. Y.

**Scales, Manufacturers of.**  
 Buffalo Scale Co., Buffalo, N. Y.  
 Chatillon, John & Sons, 85-89 Cliff, N. Y.

**Scrapers, Road.**  
 Am. Steel Scraper Co., Sydney, Ohio.  
 Kilbourne & Jacobs Mfg. Co., Columbus, O.  
 Sidney Steel Scraper Co., Sidney, O.

**Screens, Coal and Ore.**  
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.

**Screens, Door and Window.**  
 Phillips, A. J. & Co., Fenton, Mich.  
 White, Van Gahn & Co., 15-17 Chatham Sq., N. Y.

**Screw Cutting Machinery.**  
 Wells Bros. & Co., Greenfield, Mass.  
 Wiley & Russell Mfg. Co., Greenfield, Mass.

**Screw Drivers.**  
 Brown, R. H. & Co., New Haven, Conn.  
 Gay & Parsons.  
 Mayhew, H. H. Co., Shelburne Falls, Mass.

**Screw Plate and Pipe Cutter.**  
 Jarecki Mfg. Co., Erie, Pa.

**Screws, Makers of.**  
 American Screw Co., Providence, R. I.  
 Blake & Johnson, Waterbury, Conn.  
 Wm. H. Haskell Co., Pawtucket.  
 Miles, F. S., 205 Quarry, Philadelphia.  
 New England Screw Co., Boston, Mass.  
 Reynolds & Co., New Haven, Conn.  
 Worcester Machine Screw Co., Worcester, Mass.

**Scroll Saws.**  
 Barnes, W. F. & John, Rockford, Ill.  
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.

**Scythe Stones & Whetstones.**  
 Pike Mfg. Co., Pike Stat'n, N. H.  
 Cleveland Stone Co., Cleveland, O.

**Sewing Machines.**  
 Household Sewing Machine Co., Chicago, Ill.

**Shafting, Makers of.**  
 Brown, A. & F., 17 Dey St., N. Y.  
 Cresson, Geo. V. Co., Philadelphia, Pa.  
 Fairmount Mch. Co., Philadelphia, Pa.  
 Sellers, Wm. & Co., Inc., Phila.  
 Stow Mfg. Co., Binghamton, N. Y.

**Shaft Support.**  
 Decatur Shaft Support Co., Decatur, Ill.

**Shaped Iron and Steel, Manufacturers of.**  
 Aetna-Standard Iron & Steel Co., Bridgeport, O.  
 East Chicago F'dry Co., Chicago, Ill.

Allentown Rolling Mill, Allentown, Pa.  
Lockhart Iron & Steel Co., Pittsburgh, Pa.  
Passaic Rolling Mill Co., Paterson, N.J.  
Pottsville Iron & Steel Co., Pottsville, Pa.  
Roberts, A. & P. & Co., Phila., Pa.  
The Phoenix Iron Co., Phila., Pa.

**Shears and Scissors.**  
Acme Shear Co., Bridgeport, Conn.  
Heinrichs, R. Sons Co., Newark, N. J.

**Sheet Iron and Steel, Manufacturers of.**  
Aetna-Standard Iron and Steel Co., Bridgeport, O.  
Cambridge Iron & Steel Co., Cambridge, Ohio.  
Chess Bros., Pittsburgh, Pa.  
Jersey City Galvanizing Co., 112 John St., N. Y.  
Mahoning Valley Iron Co., Livingston, Ohio.  
Morehead-McCleane Co., Pittsburgh.  
Pierson & Co., 29 Broadway, N. Y.  
Singer, Nimick & Co., Ltd., Pittsburgh, Pa.  
The Mahoning Valley Iron Co., Youngstown, O.  
Alan Wood Co., Philadelphia.  
W. Dewees Wood Co., McKeesport, Pa.

**Sheet Zinc.**  
Matthiessen & Hegeler Zinc Co., La Salle, Ill.

**Show Cases.**  
Union Show Case Co., Chicago, Ill.

**Sinks.**  
Douglas, W. & B., Middletown, Conn.

**Skates, Ice.**  
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.

**Skates, Roller.**  
Henley, M. C., Richmond, Ind.  
Union Hardware Co., Torrington, Ct.  
Winslow, Sam'l., Skate Mfg. Co., Worcester, Mass.

**Slag Machines.**  
Cambria Iron Co., Johnstown, Pa.

**Smelting Works.**  
Reeves, Paul S., 760 S. Broad, Phila.

**Soldering Coppers.**  
Clendenin Bros., Baltimore, Md.  
Covert Mfg. Co., West Troy, N. Y.

**Speaking Tubes.**  
Ostrander, W. R. & Co., 204 Fulton St. N. Y.  
Wollensak, J. F., Chicago, Ill.

**Spelter.**  
Matthiessen & Hegeler Zinc Co., La Salle, Ill.  
Missouri Metal Co., St. Louis, Mo.

**Spoons and Forks.**  
Boardman, L. & Son, New Haddam, Conn.  
Holmes & Edwards Silver Co., Bridgeport, Conn.  
Rogers, The Wm. Mfg. Co., Hartford, Conn.

**Sporting Goods.**  
Hartley & Graham, 313-315 B'way, N. Y.

**Springs.**  
Clark & Cowles, Plainville, Ct.  
Dunbar Bros., Bristol, Conn.  
Miller & Van Winkle, Brooklyn, N. Y.  
Morgan Spring Co., Worcester, Mass.  
Roland, Wm. & Harvey, Phila., Pa.  
Sabin Machine Co., Montpelier, Vt.  
Washburn & Moen Mfg. Co., Worcester, Mass.  
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.

**Spring Hinges.**  
Bommer Bros., Brooklyn, N. Y.  
Chicago Spring Butt Co., Chicago, Ill.  
Pullman Sash Balance Co., Rochester, N. Y.  
Stover Mfg. Co., Freeport, Ill.  
Van Wagoner & Williams Hdw. Co., 14 Warren St., N. Y.

**Stamped Ware.**  
Am. Stamping Co., 104 & 106 John St., New York.

**Stamping Works.**  
Avery Stamping Co., Cleveland, O.  
Cleveland Stamping & Tool Co., Cleveland, O.

**Straps.**  
Cobb & Drew, Plymouth, Mass.  
Titchener, E. H. & Co., Binghamton, N. Y.

**Steam Gauges.**  
Bristol Co., Waterbury, Conn.

**Steam Hammers, &c., Makers of.**  
Diebolt & Eisenhardt, Philadelphia.  
Dudgeon, Richard, 24 Columbia Street, N. Y.  
Tretlow Mfg. Co., Pittsburgh, Pa.

**Steam Heating & Oil Separators.**  
Webster, Warren & Co., Camden, N. J.

**Steam Separators.**  
Goubert Mfg. Co., 32 Cortlandt St., N. Y.  
Harrison Safety Boiler Wks., Phila., Pa.  
Webster, Warren & Co., Camden, N. J.

**Steam Specialties.**  
Lunkenheimer Co., Cincinnati, O.

**Steel, Cold Rolled Strip.**  
Superior Steel Co., Pittsburgh, Pa.  
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Steel Figures and Alphabets.**  
Krogstad, W., 61 Fulton St., N. Y.

**Steel Importers.**  
Abbott, Wheelock & Co., N. Y. and Boston.  
Hobson, Francis, Seaman & Co., 97 John St., N. Y.  
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.  
Milne, A. & Co., 1 Broadway, N. Y.  
Newton & Shipman, 83 John, N. Y.  
Wetherell Bros., 93 Liberty St., N. Y.  
Whitney, A. R. & Co., B'way, N. Y.  
Wolf, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.

**Steel (Mushet's Special).**  
Jones, B. M. & Co., Boston.

**Steel Manufacturers.**  
Aetna-Standard Iron & Steel Co., Bridgeport, O.  
Bethlehem Iron Co., S. Bethlehem, Pa.  
Baker, Hermann & Co., 103 Duane St., Carbon Steel Co., Pittsburgh, Pa.  
Chester Steel Castings Co., Phila., Pa.  
Chrome Steel Works, Brooklyn, N. Y.  
Crescent Steel Co., Pittsburgh, Pa.  
Frankford Steel Co., Philadelphia.  
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.  
Hobson, Francis, Seaman & Co., 97 John St., N. Y.  
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.  
Kayser, Ellison & Co., Sheffield, Eng.  
La Belle Steel Co., Pittsburgh, Pa.  
Lukens Iron & Steel Co., Coatesville, Pa.  
Morehead-McCleane Co., Pittsburgh, Pa.  
Moss, F. W., 83 John, N. Y.  
Pottsville Iron and Steel Co., Pottsville, Pa.  
Bowland, Wm. & Harvey, Frankford, Philadelphia.  
Singer, Nimick & Co., Pittsburgh, Pa.  
Superior Steel Co., Pittsburgh, Pa.  
Valley Steel Co., St. Louis, Mo.  
Wordlaw, S. & U., Sheffield, Eng.  
Wetherell Bros., 93 Liberty, N. Y.  
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Steel, Manufacturers' Agents.**  
Farns, C. K. & Co., Philadelphia, Pa.  
Butze, Adolph, St. Louis, Mo.  
Corning, Edw. & Co., 29 B'way, N. Y.  
Lindsay, Jas. G. & Co., Phila., Pa.  
Pierson & Co., 29 Broadway, N. Y.

**Steel Rails, Manufacturers of.**  
Bethlehem Iron Co., S. Bethlehem, Pa.  
Cambria Iron Co., Johnstown, Pa.  
Montour Iron & Steel Co., Danville, Pa.  
Riverside Iron Wks., Wheeling, W. Va.

**Steel, Tool.**  
Frankford Steel Co., Philadelphia, Pa.  
Jessop, Wm. & Sons, Sheffield, England, 91 John, N. Y.  
Jones, B. M. & Co., Boston, Mass.  
La Belle Steel Co., Pittsburgh, Pa.

**Step Ladders, Rolling.**  
Bicycle Step Ladder Co., Chicago, Ill.  
Coburn Trolley Track Mfg. Co., Holyoke, Mass.  
Croissant, M., Albany, N. Y.  
Morley Bros., Saginaw, Mich.

**Stocks and Dies.**  
Armstrong Mfg. Co., Bridgeport, Conn.  
Billings & Spencer Co., Hartford, Conn.  
Butterfield & Co., Derby Line, Vt.  
Hart Mfg. Co., Cleveland, O.  
Oster Mfg. Co., Cleveland, O.  
Saunders' Sons, D., Yonkers, N. Y.  
Wells Bros. & Co., Greenfield, Mass.  
Wiley & Russell Mfg. Co., Greenfield, Mass.

**Stone Saws and Planers.**  
Lincoln Iron Works, Rutland, Vt.

**Stove Linings.**  
Ostrander Fire Brick Co., Troy, N. Y.

**Stove Pipe Thimbles.**  
Cheney, S. & Son, Manlius, N. Y.

**Stove Trucks.**  
Gwiner Mfg. Co., Hamilton, Ohio.

**Stoves, Gasoline.**  
Standard Lighting Co., Cleveland, O.

**Street Lamps.**  
Rochester Lamp Co., 42 Park Place, New York.  
Steam Gauge & Lantern Co., Syracuse, N. Y.

**Structural Iron Work.**  
Berlin Iron Bridge Co., East Berlin, Conn.  
Lindsay, Jas. G. & Co., Phila., Pa.

**Sulphuric Acid.**  
Matthiessen & Hegeler Zinc Co., La Salle, Ill.

**Tacks, Brads, Staples, &c.**  
Anthony & Cushman Tack Co., Taunton, Mass.  
Atlas Tack Corporation, Boston, Mass.  
Clendenin Bros., Baltimore, Md.  
Cobb & Drew, Plymouth, Mass.  
Grand Crossing Tack Co., Grand Crossing, Ill.

**Taps and Dies.**  
Butterfield & Co., Derby Line, Vt.  
Carpenter, J. M., Tap & Die Co., Pawtucket, R. I.  
Manning, Maxwell & Moore, 111 Liberty St., N. Y.  
Wells Bros. & Co., Greenfield, Mass.  
Wiley & Russell Mfg. Co., Greenfield, Mass.

**Testing Laboratories.**  
Riehle Bros. Testing Mach. Co., Philadelphia.

**Testing Machines.**  
Riehle Bros. Testing Mach. Co., Phila.

**Theatrical Hardware.**  
Wollensak, J. F., Chicago, Ill.

**Thill Springs.**  
Frost Thill Spring Co., Boston, Mass.  
Sabin Machine Co., Montpelier, Vt.

**Thrust Collars.**  
Gouverneur Mach. Co., Gouverneur, N. Y.

**Timber and Mineral Lands.**  
Robertson, M. Co., Cincinnati, O.

**Time Record.**  
Scattergood, H. W., Phila., Pa.

**Tin Plate Machinery.**  
Lloyd Booth Co., Youngstown, Ohio.

**Tinware.**  
Am. Stamping Co., 104 & 106 John St.

**Tire Upsetters.**  
Butts & Ordway, Boston, Mass.

**Toe Calks, Steel.**  
Burke, F. F., Boston, Mass.

**Tool Blocks.**  
Hubert-Rogers Mch. Co., South Sudbury, Mass.

**Tool Chests.**  
Am. Tool Co., 200 W. Houston St., N. Y.

**Tool Holders.**  
Armstrong Bros. Tool Co., Chicago, Ill.

**Tools.**  
Britton, Horace E., Stoughton, Mass.  
Brown, R. H. & Co., New Haven, Conn.  
Fray, Jno. S. & Co., Bridgeport, Conn.  
Hoggson & Pettis Mfg. Co., New Haven, Conn.  
Mayhew, H. H. Co., Shelburne Falls, Mass.  
Millers Falls Co., 93 Reade, N. Y.  
Richardson, C. F. & Son, Athol, Mass.  
Standard Tool Co., Athol, Mass.  
Stanley Rule & Level Co., 29 Chambers, Starrett, L. S., Athol, Mass.  
Tower & Lyon, 95 Chambers St., N. Y.  
Wilkinson, A. J. & Co., Boston, Mass.

**Tools, Blacksmith and Wheelwright.**  
Buffalo Forge Co., Buffalo, N. Y.  
Butts & Ordway, Boston, Mass.  
Champion Blower & Forge Co., Lancaster, Pa.  
Plumb, Favette R., Philadelphia, Pa.  
Wiley & Russell Mfg. Co., Greenfield, Mass.

**Tools, Steam and Gas Fitters'.**  
Saunders' Sons, D., Yonkers, N. Y.

**Tools, Tinners'.**  
Peerless Cooker Co., Buffalo, N. Y.

**Torches, Oil and Gasoline.**  
Dangley Stove & Mfg. Co., Cleveland, O.  
Schneider & Trenkamp Co., Cleveland, Ohio.

**Tramway Lifters.**  
Wollensak, J. F., Chicago, Ill.

**Trucks, Manufacturers of.**  
Clark, G. F., Windsor Locks, Conn.

**Tubes, Seamless Drawn Copper.**  
Anasoda Brass & Copper Co., 19 and 21 Cliff, N. Y.  
Randolph & Clowes, Waterbury, Conn.

**Tubes, Steel.**  
Avery Stamping Co., Cleveland, O.  
Lena's, John S. Son & Co., 4 Fletcher St., New York.  
Shelby Steel Tube Co., Shelby, Ohio.  
U. S. Projectile Co., Brooklyn, N. Y.

**Tumbling Barrels.**  
Henderson Bros., Waterbury, Conn.

**Turnbuckles.**  
Central Iron & Steel Co., Brazil, Ind.  
Cleveland City Forge & Iron Co., Cleveland, O.  
Merrill Bros., Brooklyn, E. D.

**Twist Drills, Makers of.**  
Cleveland Twist Drill Co., Cleveland.  
Morse Twist Drill & Machine Co., New Bedford, Mass.  
New Process Twist Drill Co., Taunton, Mass.  
Standard Tool Co., Cleveland.

**Valves, Gas, Water and Steam.**  
Chapman Valve Mfg. Co., Boston.  
Yvon-Evans Mfg. Co., Philadelphia, Pa.  
Jenkins Bros., 71 John, N. Y.  
Lunkenheimer Co., Cincinnati, O.  
McNab & Harlin Mfg. Co., 56 John, N. Y.

**Ventilating Fans.**  
Huyett & Smith Mfg. Co., Detroit, Mich.

**Ventilator Appliances.**  
Howard & Morse, 45 Fulton St., N. Y.

**Vise Jaws.**  
Newark Mch. Tool Co., Newark, N. J.

**Vises.**  
Hollands Mfg. Co., Erie, Pa.  
Howard Iron Works, Buffalo, N. Y.  
Millers Falls Co., 93 Reade St., N. Y.  
Prestiss Vise Co., 44 Barclay, N. Y.  
Tower & Lyon, 95 Chambers St., N. Y.

**Wagon Jacks.**  
Covert Mfg. Co., West Troy, N. Y.  
Covert's Saddlery Works, Farmer, N. Y.

**Wagon Poles.**  
Hartzell, Geo. W., Greenville, Ohio.

**Washboards.**  
Olds Wagon Wks., Ft. Wayne, Ind.

**Washers.**  
Haskell, Wm. H. Co., Pawtucket, R. I.  
Milton Mfg. Co., Milton, Pa.  
Sternberg, J. H. & Son, Reading, Pa.

**Washing Machines.**  
Benbow Mfg. Co., St. Louis, Mo.  
Diether & Barrows, Ft. Wayne, Ind.  
Wayne, Anthony Mfg. Co., Ft. Wayne, Ind.

**Watches.**  
Ingersoll, R. H. & Bro., 65 Cortlandt St., N. Y.

**Water Meters.**  
Worthington, Henry R., 86 & 88 Liberty St., N. Y.

**Water Wheels.**  
Poole, Robt. & Son Co., Baltimore, Md.

**Wheelbarrows.**  
Amer. Steel Scraper Co., Sidney, Ohio.  
Bryan Mfg. Co., Bryan, Ohio.  
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.  
Sidney Steel Scraper Co., Sidney, O.  
Toledo Wheelbarrow Wks., Toledo, O.

**Wheels.**  
Arnold Metal Wheel Co., New London, Ohio.

**Window Cleaners.**  
Bourke Mfg. Co., Youngstown, O.

**Window Cord, Makers of.**  
Samson Cordage Works, Boston, Mass.

**Wire, Manufacturers of.**  
American Wire Co., Cleveland, Ohio.  
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.  
Miller & Van Winkle, Brooklyn, N. Y.  
New Castle Wire Nail Co., New Castle, Pa.  
New Haven Wire Mfg. Co., New Haven, Conn.  
Salem Wire Nail Co., Salem, O.  
Trenton Iron Co., Trenton, N. J.  
Washburn & Moen Mfg. Co., Worcester.  
Wetherell Bros., 93 Liberty St., N. Y.  
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.  
Wright & Colton Wire Cloth Co., Worcester, Mass.

**Wire Cloth.**  
Barnum, E. T., Detroit, Mich.  
Clinton Wire Cloth Co., Clinton, Mass.  
Darby, Edward & Sons, Philadelphia.  
Estey, W. S., 65 Fulton, N. Y.  
Gilbert & Bennett Mfg. Co., 42 Cliff.  
Howard & Morse, 45 Fulton, N. Y.  
Ludlow-Saylor Wire Co., St. Louis, Mo.  
N. J. Wire Cloth Co., Trenton, N. J.  
Scheeler & Sons, Buffalo, N. Y.  
Wickwire Bros., Cortland, N. Y.  
Wright & Colton Wire Cloth Co., Worcester, Mass.  
W. S. Tyler Wire Works Co., Cleveland.

**Wire Cutters.**  
Higginum Hdw. Co., Higganum, Conn.  
King, J. M. & Co., Watertown, N. Y.

**Wire Dies.**  
McFarland, Wm., Trenton, N. J.  
Newton & Shipman, 83 John St., N. Y.

**Wire Fences, See Fencing, Iron and Wire.**

**Wire Goods, Manufacturers of.**  
Bromwell Brush & Wire Goods Co., Cincinnati, Ohio.  
Darby, Edward & Sons, Phila.  
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.  
Ludlow-Saylor Wire Co., St. Louis.  
Ossawan Mills Co., Norwich, Conn.  
Scheeler & Sons, Buffalo, N. Y.  
Wickwire Bros., Cortland, N. Y.  
Williamson, C. T., Wire Novelty Co., Newark, N. J.  
Wire Goods Co., Worcester, Mass.

**Wire Machinery.**  
Am. Tool Wks., Cleveland, O.  
Manville, E. J. Mch. Co., Waterbury, Ct.  
Morgan Construction Co., Worcester, Mass.  
Waterbury Mch. Co., Waterbury, Conn.

**Wire Straightening and Cutting Machinery.**  
Add, John & Son, New Haven, Conn.

**Wire Nails.**  
Bond Nail Co., Raynham, Mass.  
Indiana Wire Fence Co., Crawfordsville, Ind.  
Kilmer Mfg. Co., Newburg, N. Y.  
New Castle Wire Nail Co., New Castle, Pa.  
Phillips, Townsend & Co., Phila., Pa.  
Salem Wire Nail Co., Salem, O.  
Taunton Wire Nail Co., Taunton, Mass.  
Whitney, A. R. & Co., New York City.

**Wire Rods, Steel.**  
American Wire Co., Cleveland, Ohio.  
New Castle Wire Nail Co., New Castle, Pa.  
Washburn & Moen Mfg. Co., Worcester, Mass.  
Whitney, A. R. & Co., 17 B'way, N. Y.  
Wolf, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.

**Wire Rope, Iron and Steel, Makers.**  
Broderick & Bascom Rope Co., St. Louis, Mo.  
California Wire Works, San Francisco.

**Wire Rope, Steel.**  
Hazard Mfg. Co., Wilkesbarre, Pa.  
A. Leschen & Sons Rope Co., St. Louis.  
Trenton Iron Co., Trenton, N. J.  
Washburn & Moen Mfg. Co., Worcester, Mass.

**Wire Rope Machinery.**  
Kay, J. F., Passaic, N. J.

**Wire, Spool.**  
Mallin & Co., Cleveland, O.

**Wood Turning.**  
Cleveland Wood Turning Co., Cleveland, O.

**Wood-Working Machinery.**  
Fay, J. A. & Co., Cincinnati, O.  
Seneca Falls Mfg. Co., Seneca Falls, N. Y.  
Wilkinson, A. J. & Co., Boston, Mass.

**Wrenches, Manufacturers.**  
Bemis & Call Hardware & Tool Co., Springfield, Mass.  
Billings, Spencer & Co., Hartford, Conn.  
Goes Wrench Co., Worcester, Mass.  
Tower & Lyon, 95 Chambers St., N. Y.  
Trimont Mfg. Co., Roxbury, Pa.  
Walworth Mfg. Co., Boston, Mass.  
Williams, J. H., Brooklyn, N. Y.

**Wringers.**  
Colby Wringer Co., Montpelier.  
National Wringer Co., Canton, O.

**Yacht Hardware.**  
Ferdinand, L. W. & Co., Boston, Mass.

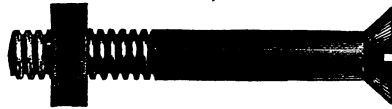
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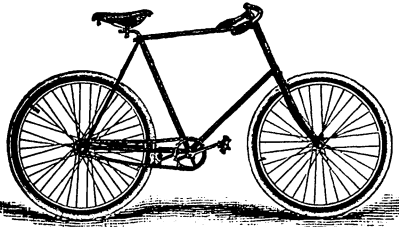
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McClure & Amsler.....	27	Pennsylvania Bolt & Nut Co.....	112	Shelby Steel Tube Co.....	28	Warner Elevator Mfg. Co.....	54
McCoy, Jos. F. & Co.....	54	Penna. Diamond Drill & Mfg. Co.....	25	Sherwood Mfg. Co.....	33	Washburn & Moen Mfg. Co.....	4
McFarland, Wm.....	4	Penna. Elevator Engineering Co.....	50	Shoenberger & Co.....	102	Waterbury Brass Co.....	2
McGowan, J. H. & Co.....	37&100	Penn Iron Roofing & Corrugating Co.	12	Shultz Belting Co.....	1	Waterbury Farrel Foundry & Ma-	
McIlvain, Wm. & Sons.....	27	Pennsylvania Mch. Co.....	57	Sickels, Sweet & Lyon.....	74	chine Co.....	37
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Mahoning Valley Iron Co.....	23	Phosphor Bronze Smelting Co.....	8	Smith & Egge Mfg. Co.....	101	Wetherhill, Robt. & Co.....	121
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Malin & Co.....	74	Pike Mfg. Co.....	85	Smith, J. D. Foundry Supply Co.....	25	White, L. & I. J. Co.....	75
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Manville Machine Co., E. J.....	58	Piqua Handle & Mfg. Co.....	82	Snell Mfg. Co.....	83	White, Van Glahn & Co.....	74
Mansfield, H. H.....	58	Pittkin, A. B. Machinery Co.....	59	Sommer's Son, John.....	122	Whitlock Coll Pipe Co.....	35
Maris & Beekley.....	51	Pittsburgh I. & S. Eng. Co.....	27	Southwark Foundry & Machine Co.	32	Whitney, A. R. & Co.....	20
Marlin, J. & Son.....	37	Pittsburgh Mfg. Co.....	36	Specialty Mfg. Co.....	75	Whitton, D. S. Mch. Co.....	47
Massey & Thompson.....	83	Pittsburgh Reduction Co.....	64	Speldel, J. G.....	51	Wickes Bros.....	26
Mathiessen & Hegeler Zinc Co.....	2	Place, Geo.....	57	Spencer's I. S. Sons.....	28	Wilcox & Howe Co.....	100
Maurer, H. & Son.....	28	Plumb, Fayette R.....	78	Springfield Gas Engine Co.....	32	Wiley & Russell Mfg. Co.....	46&122
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Merrill Mfg. Co.....	45	Poole, Robt. & Son Co.....	36	Standard Lighting Co.....	84	Williamson, C. T. Wire Nov. Co.....	86
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Millers Falls Co.....	20	Porter, H. K.....	113	Stark Mch. & Tool Co.....	42	Wilson, J. Fred.....	114
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Monce, S. G.....	87	Pratt & Whitney Co.....	43	Stevens & Romaine Mfg. Co., Ltd.	112	Wister, L. & R. & Co.....	23
Monroe Refrigerator Co.....	96	Prentiss Tool & Supply Co.....	57	Stiles & Parker Press Co.....	40	Wolf, W. & L.....	39
Montour Iron & Steel Co.....	23	Prentiss Vise Co.....	68	Stirling Co.....	35	Wolf, R. H. & Co. Ltd.....	5
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Morgan Construction Co.....	4	Randall Fence Co.....	12	Stow Mfg. Co.....	49	Woodward & Rogers.....	44
Morgan Spring Co.....	4	Randolph & Clowes.....	1	Streeter, N. R. & Co.....	89	Wooster, F. V.....	101
Morley Bros.....	91	Ransom Hardware Co.....	74	Stuart & Peterson Co.....	92	Worcester Mch. Screw Co.....	114
Morrison, Robert.....	32	Razorine Mfg. Co.....	56	Sturtevant, B. F. Co.....	43	Worthington, Henry R.....	37
Morse Twist Drill & Machine Co.....	49	Reading Hardware Co.....	98	Sturtevant Mill Co.....	53	Wright & Colton Wire Cloth Co.....	8
Morse, Williams & Co.....	51	Read, Wm. & Sons.....	121	Sun Mfg. Co.....	36	Wrightsville Hardware Co.....	65
Morton, Thos.....	106	Reece, Edw. F.....	47	Superior Steel Co.....	5	Wurster, F. W. & Co.....	122
Moseley Iron Bridge & Roof Co.....	12	Reeves, Paul S.....	122	Supple Hardware Co.....	111	Wyman & Gordon.....	106
Mount Carmel Bolt Co.....	121	Reeves Pulley Co.....	54	Sweetser, W. A.....	28	Yale & Towne Mfg. Co.....	50&87
Murphy, P. D.....	84	Remington Arms Co.....	87	Swindell, W. & Bros.....	26	Zucker & Levett Chem. Co.....	30
Myers, F. E. & Bro.....	68	Republic Press.....	36	Syracuse Smelting Works.....	10		
National Horse Nail Co.....	105	Reynolds & Co.....	14	Syracuse Twist Drill Co.....	77		
National Pipe Bending Co.....	34	R.I. Perkins Horse Shoe Co.....	103	Taintor Mfg. Co.....	70		
National Saw Co.....	70	Rhodes, L. E. Co.....	56	Tablet & Ticket Co.....	56		
National Wringer Co.....	95	Rice Mfg. Co.....	25				
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New Castle Wire Nail Co.....	15	Richards, I. P.....	121				
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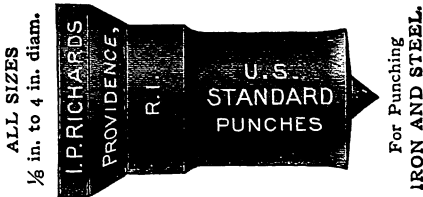
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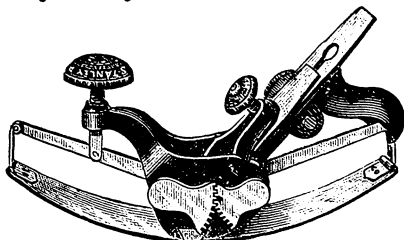
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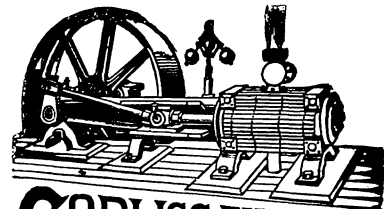
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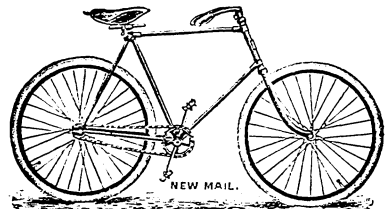


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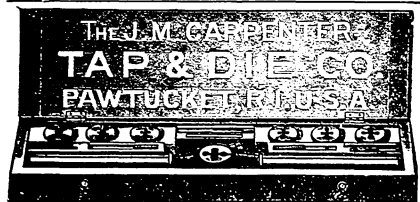
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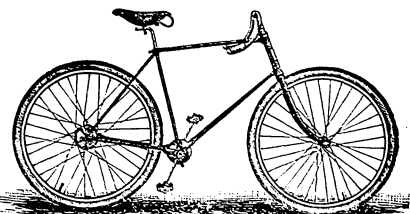
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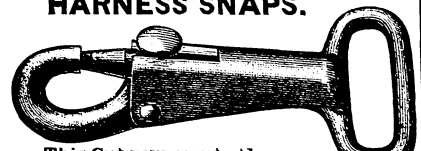
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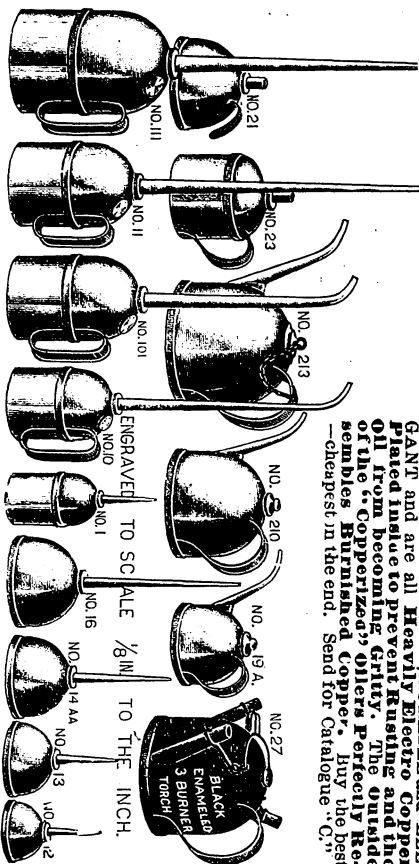
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The results obtained by the Heilmann electric locomotive in France appear to contribute materially toward a satisfactory solution of the problem of electric traction. If the published reports of

motive was impelled by electricity and drew eight heavy coaches containing over 250 people. The company who were present at the trial, comprising a number of distinguished engineers and others interested in railroad work, are represented as speaking very highly of

## Tests of Tandem Compound Blowing Engines.

A pair of horizontal tandem compound condensing blowing engines were built some time since by Mackintosh,

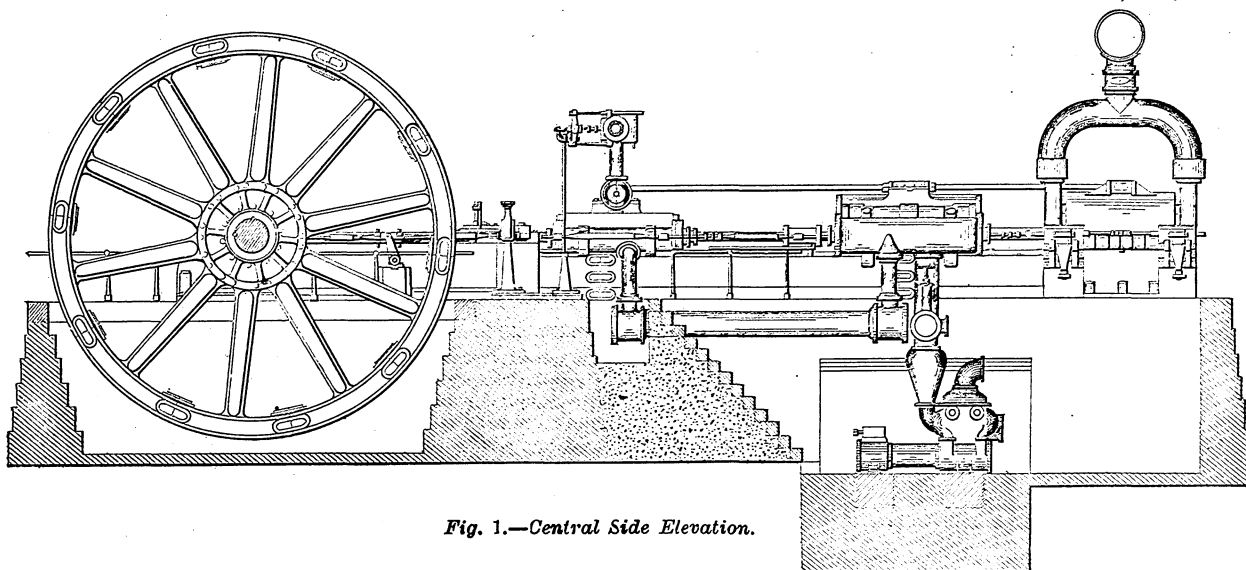


Fig. 1.—Central Side Elevation.

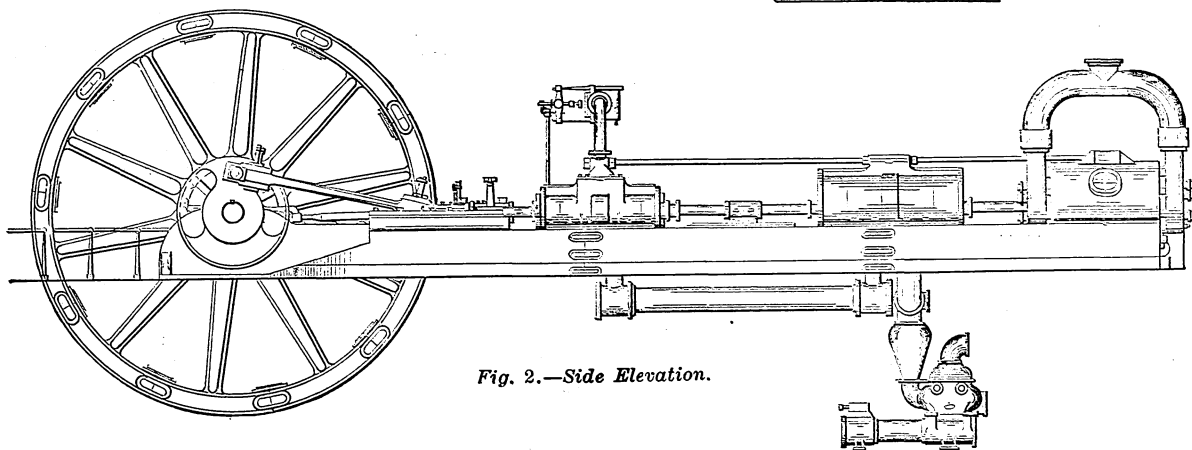


Fig. 2.—Side Elevation.

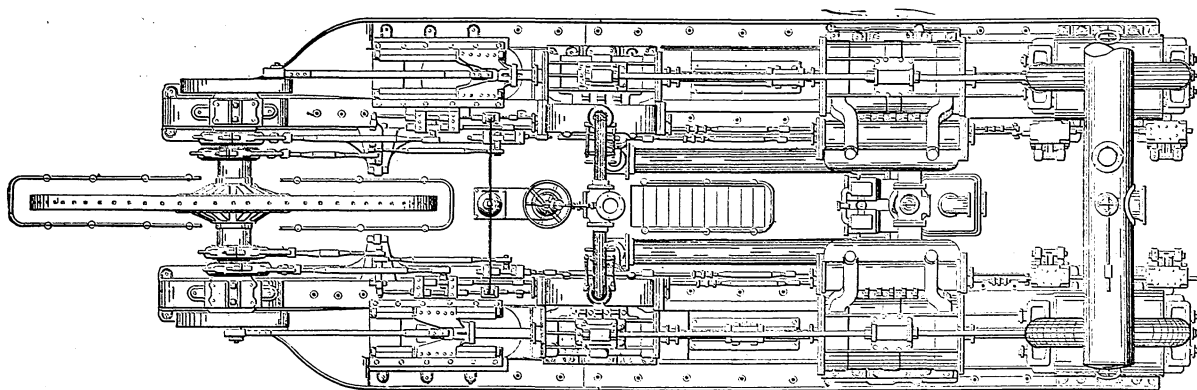


Fig. 3.—Plan.

## TESTS OF TANDEM COMPOUND BLOWING ENGINES.

the achievements of M. L. Heilmann's engine are to be relied on, the "Fusée Electrique," on her recent trial trip from Paris to Mantes, a distance of 36 miles, attained an average speed of 46 miles an hour, with a maximum speed of 65 miles during a portion of her run. The loco-

the locomotive and of its smoothness of operation. The designer is confident that an average speed of 55 miles an hour will be easily attained before long. The "Fusée Electrique" is to be run regularly on the lines of the Compagnie de l'Ouest, between Paris and Mantes.

Hemphill & Co. of Pittsburgh, for the Monongahela Furnace Company of McKeesport, Pa., where they are now in operation. Fig. 1 is a central side elevation of one pair of engines; Fig. 2 is side elevation; Fig. 3 is a plan and Figs. 4 to 7 are cross sections, as indicated.

From tests made of these engines by Daniel Ashworth, mechanical and consulting engineer, of Pittsburgh, we take the following data:

*Dimensions.*

Diameter of high pressure cylinders, inches.....	28
Diameter of low pressure cylinders, inches.....	50
Diameter of air cylinders, inches.....	54
Stroke, inches.....	60
Diameter of high pressure piston rod (crank end), inches.....	7 $\frac{1}{2}$
Diameter of high pressure piston rod (head end), inches.....	8
Diameter of low pressure piston rod (crank end), inches.....	6
Diameter of low pressure piston rod (head end), inches.....	7 $\frac{1}{2}$
Ratio of cylinders.....	3.54
Clearance of high pressure cylinder, per cent.....	6.7
Clearance of low pressure cylinder, per cent.....	7.3

*Conditions and Results of Right Hand Engine.*

Boiler pressure per gauge, pounds.....	135
Vacuum per gauge, inches.....	26
Barometer, inches.....	29.45
Initial pressure (high pressure cylinder), pounds.....	50.5
Mean effective pressure (low pressure cylinder), pounds.....	14.5
Blast from air cylinder (per gauge and diagram), pounds.....	25
Revolutions per minute.....	44
Indicated horse-power of whole engine.....	719.284
Water consumed per indicated horse-power per hour, as accounted for by indicator diagrams, pounds.....	11.74
Same, including steam consumed for pumps by condenser, pounds.....	13.05
Same, with allowance for cylinder condensation, computed by formulas applicable to same, pounds.....	16.97
Percentage of moisture in steam as shown by calorimeter.....	0.45 of 1 per cent.
Quality of steam.....	99.55 per cent.

*Conditions and Results of Left Hand Engine.*

Boiler pressure, pounds.....	110
Vacuum per gauge, inches.....	26
Barometer, inches.....	29.3
Initial pressure (high pressure cylinder), pounds.....	97
Cut off at $\frac{1}{2}$ inch (low pressure cylinder).....	
Mean effective pressure (high pressure cylinder), pounds.....	52
Mean effective pressure (low pressure cylinder), pounds.....	12
Revolutions per minute.....	40
Indicated horse-power of whole engine.....	606.63
Blast from air cylinder (per gauge and diagram), pounds.....	27
Water consumed per indicated horse-power per hour, as accounted for by indicator diagrams, pounds.....	11.34
Same, including steam consumed by pumps for condenser, pounds.....	13.45
Same, with allowance for cylinder condensation, computed by formulas applicable to same, pounds.....	16.68
Percentage of moisture in steam as shown by calorimeter.....	0.475 of 1 per cent.
Quality of steam.....	99.53 per cent.

*Summary.*

Total horse-power absorbed by both engines.....	1,325.91
Horse-power of pumps.....	17.6
Total horse-power of engines and pumps.....	1,348.51
Average steam consumption per horse-power per hour of both engines, as accounted for by indicator, pounds.....	11.39
Steam consumption of pumps per horse-power per hour, pounds.....	31
Average steam consumption per horse-power per hour of both pumps and engines, pounds.....	13.75
Same, with allowance for cylinder condensation, computed by formulas applicable to same, pounds.....	16.54
Average moisture in steam as shown by calorimeter.....	0.45 of 1 per cent.
Average quality of steam.....	99.54 per cent.

These engines are furnished with steam from a battery of Babcock & Wilcox water tube boilers, the steam being conveyed to a receiver, and from thence supplied to the engines through steam pipe of liberal capacity.

The steam valves for the engines consist of adjustable cut off for the high pressure cylinder and fixed cut off for the low pressure cylinder. The condenser used in connection with the engines is of the Worthington duplex type. In addition to the ordinary duties devolving upon it, it lifts its column of water 24 feet high.

Preliminary to the test, the valves were adjusted to produce diagrams of a satisfactory character, after which general tests were made under regular conditions, the results of which are given above. These results show an excellent operation in every respect, exhibiting not only first-class economy but excellent working conditions, de-

the shrinkage in exports. Several failures with large liabilities are reputed in that city.

**The Chicago Hard Copper Company.**

The Chicago Hard Copper Company, recently incorporated under the laws of the State of Illinois, with headquarters at 911 Ashland Block, Chicago, have been organized for the purpose of utilizing some recent discoveries for purifying, hardening and tempering copper. By the process controlled by the company copper is so purified that castings made of it are free from blow holes. Copper is rendered harder, and yet is

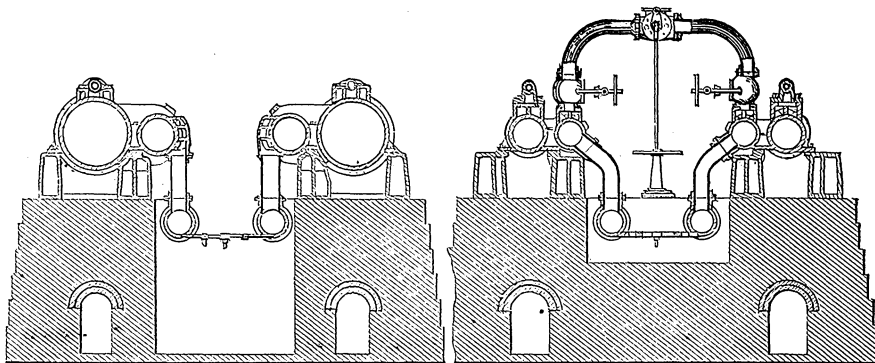


Fig. 4.

Fig. 5.

*Cross Sections through Low and High Pressure Cylinders.*

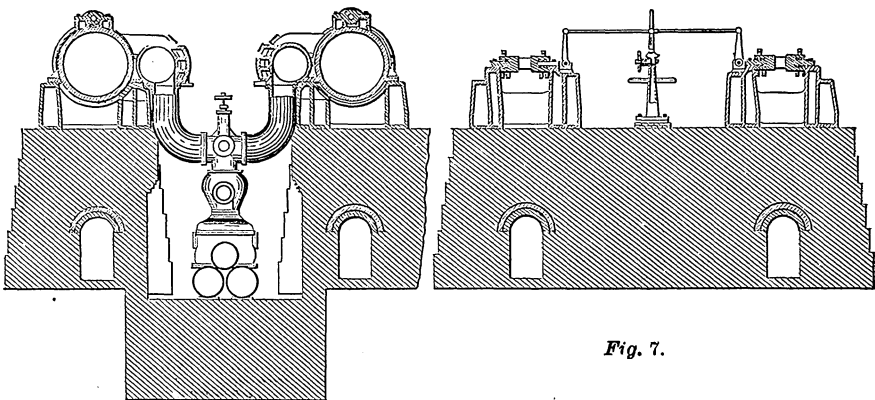


Fig. 6.

*Cross Sections through Low Pressure Cylinders and Cross Head Guides.*

**TESTS OF TANDEM COMPOUND BLOWING ENGINES.**

veloping the power and the duties required with admirable ease and freedom. The steam consumption per horse-power per hour, as accounted for by the indicator, shows first class results for this type of engine. The valves upon the cylinder work in a most admirable manner. From a mechanical standpoint the designing and workmanship are certainly of the highest type, reflecting credit upon the designers and constructors.

In order to ascertain the quality of steam supplied to engines, calorimeter was attached at the closest point to the cylinder just before the steam was delivered for the actual requirements of work. The tests exhibited an excellent quality of steam containing but 0.46 of 1 per cent. of moisture.

Business has become completely paralyzed in Buenos Ayres, owing to the continued rise in the premium on gold and

so tempered that it can be bent into any form without fracture. Tests of the metal show it to be much stronger and more durable when treated by this process. Such copper, rolled or drawn, appears to be stronger and better than the ordinary commercial copper. This treated copper without alloy makes first-class bells, some of which are now in use on the North Chicago cable car line. Tests have been made recently at the Washington Navy Yard, which show that the treated metal is pure copper and has much greater tensile strength than commercial copper. Arrangements are being made for the erection of a plant in the vicinity of Chicago to manufacture copper castings. The production of solid castings of pure copper, of any size, will be a new industry, and one for which there is a large field that will widen as such castings become better known.

The Amalgamated Scale.

The following are the points gathered from a comparison of the present Western wages scales and the scale proposed for the coming year by the Amalgamated Association of Iron and Steel Workers.

pany shall cut such scrap from 8 to 10 inches in length before charging.

Knobbling is unchanged, as is the rate on heating slabs and shingling, bar and nail plate mills, guide, 10 inch hoop and cotton tie mills except channel iron and a new size of angles. The new scale on channel iron is as follows:

Channel Iron.

Sizes.	Total.	Roller.	Heater.	Rougher and catcher, each.
1 3/4 x 1/2 to 5/8 x 3/16 and heavier.....	\$2.35	\$1.17 1/2	\$0.58 3/4	\$0.29 3/8
1 3/4 x 1/2 to 5/8 x 1/8.....	2.71	1.35 1/2	.67 3/4	.33 3/8
1 3/4 to 1 1/16 x 1/2 to 5/8 x 3/16 and heavier.....	2.71	1.35 1/2	.67 3/4	.33 3/8
1 3/4 to 1 1/16 x 1/2 to 5/8 x 1/8.....	3.02	1.51	.75 1/2	.37 3/8
1 x 5/16 to 1 1/8 x 3/8 and heavier.....	2.83	1.41 1/2	.70 3/4	.35 3/8
1 x 5/16 to 1 1/8 x 1/2.....	3.42	1.71	.85 1/2	.42 3/4
1 x 5/16 to 1 1/8 x No. 13 and lighter.....	4.30	2.15	1.07 1/2	.53 3/4
1 1/2 x 5/16 to 1 1/2 x 3/32 and heavier.....	2.84	1.42	.71	.35 3/8
1 1/2 x 5/16 to 1 1/2 x 1/8.....	3.82	1.91	.95 1/2	.47 3/4
1 1/2 x 5/16 to 1 1/2 x No. 13 and lighter.....	4.78	2.39	1.19 1/2	.59 3/4
1 1/2 x 5/16 to 1 1/2 x 3/32 and heavier.....	3.75	1.87 1/2	.93 3/4	.46 3/8
1 1/2 x 5/16 to 1 1/2 x 1/8.....	4.99	2.49 1/2	1.24 3/4	.62 3/8
1 1/2 x 5/16 to 1 1/2 x No. 13 and lighter.....	6.23	3.11 1/2	1.55 3/4	.77 3/8
1 1/2 x 5/16 to 1 1/2 x 3/8.....	5.77	2.88 1/2	1.44 1/2	.72 3/8
1 1/2 x 5/16 to 1 1/2 x No. 13 and lighter.....	7.70	3.85	1.92 1/2	.96 3/4
1 1/2 x 5/16 to 1 1/2 x 1/2.....	6.50	3.25	1.62 1/2	.81 1/4
1 1/2 x 5/16 to 1 1/2 x No. 13 and lighter.....	8.66	4.33	2.16 1/2	1.08 1/4
1 1/2 x 1/4 to 1 1/2 x 3/8.....	7.60	3.80	1.90	.95
1 1/2 x 1/4 to 1 1/2 x No. 13 and lighter.....	10.12	5.06	2.53	1.26 1/4

Heavier and lighter means thickness in web.

In the introduction, the fifth rule which reads: "Mills may work three times in 24 hours when practicable, excepting boiling department," the last words have been stricken out.

The boiling scale has been changed. The rate on a 1.5-cent card rate, as a minimum, was made \$4.75 on November 20, 1893, as the outcome of special conferences. Now the \$4 rate for puddling has been squarely accepted. The advance is 20 cents per ton for each 1/10 cent advance in the card rate up to 2 cents, when the puddling is \$5. Then the rate is the same as before.

The charges for puddling furnaces have also been increased, the new rate reading as follows:

1. The charge for boiling furnaces shall be as follows: Single furnaces, not more than 550 pounds per heat; double furnaces, not more than 1100 pounds per heat; Siemens furnaces, not more than 1550 pounds per heat; double double furnaces, not more than 2200 pounds per heat.

The rate for cast iron swarth worked on a cinder bottom had been reduced from \$4.50 to \$4, that for half wrought iron turnings and half cast iron swarth from \$4.05 to \$3.50, and that for wrought iron turnings from \$3.09 to \$2.60.

The following note has been added:

15. When mixed material is worked, which is not provided for by the scale, the mean price between the prices of the material used shall be made, the proportion not to go below one-third; this not to apply when worked with metal.

The muck or puddle mill scale is unchanged, except that the following has been added: "On mills averaging less than 15 tons per turn in two weeks the company shall pay dragouts."

Scraping and busheling has been reduced from \$1.62 on a 1.5-cent card to \$1.55. In the notes heating piles or blooms has been made 87 cents per ton; busheling on a sand bottom has been reduced from 50 cents to 20 cents over current price for piles on boards. The fourth note has been changed to read:

4. The price for working all light sheet and wrought turnings, hoop, 19 and lighter wire and what is known as Norway scrap, on sand bottom, shall be \$2 per ton on a 1 1/2-cent card, and shall advance and decline 5 cents per ton on each one-tenth advance on said card and decline in the same proportion to a 1 1/2-cent card. The com-

The new size of angles is 1/2 x 1/2 inch, on which the total rate is \$6.80, of which the roller receives \$3.40, the heater \$1.75, and the rougher and catcher each 85 cents.

The following entirely new scale has been introduced:

Prices for Mills Making a Specialty of Working Pipe or Skelp From Iron or Steel.

When working common sized skelp or pipe iron or steel on small mills the prices at 1 1/2-cent card rate shall be \$1.06 and 53 cents for heating and 26 1/2 cents for roughing and same for catching, and shall advance 2 per cent. additional for each one-tenth advance above 1 1/2-cent card to 2 1/2-cent card and 2 per cent. decline for each reduction of one-tenth to 1 1/2-cent card.

Rollers, heaters and roughers shall be paid by the company.

Bar and 12-inch mills, when working pipe or skelp iron or steel, at 1 1/2-cent card rate:

	Per ton.
	Cents.
Rolling.....	51
Heating.....	51

Catching shall be five-eighths of the price paid for rolling and shall be paid by the company.

When working small sized skelp the price shall be \$2.12 for the mill.

One man's help shall be furnished by the company on piles of 150 pounds and an additional man on piles of 250 pounds to shove under at the rolls on all passes.

Prices to advance and decline in the same ratio as bar mill scales.

Plate and tank mills, when working pipe iron or steel at 1 1/2-cent card rate, the price shall be as follows, and shall advance and decline in the same ratio as plate mill scale:

	Per ton.
	Cents.
Rolling.....	46.6
Heating.....	58.3

It is understood that none of the above prices will be used as a criterion to reduce the prices paid for working other material.

In the plate and tank mills scale the ten per cent. off the scale has been stricken out. Roll hands shall not be required to charge or anneal. The scale on rolling pipe iron in sheet and jobbing mills is unchanged.

The sheet mill scale is unchanged except that the following has been added to the notes:

20. All defective sheets made on sheet and jobbing mills that will trim 72 inches long by 24 inches wide, and larger sizes, shall be paid for; and it is also understood that mills working orders less than 72 x 24 sheets cut down to smaller sizes shall be paid for.

21. Double slabs, 14 to 18 gauge inclusive \$1.50 per ton extra.

22. Single slabs, rolled in pairs, 15, 16 and 17 gauges, \$1 per ton extra. Sheets not to exceed 28 square feet in area.

23. Eighteen gauge exceeding 40 x 96 to be rolled from bars. When working above orders and annealing reduces the output, the firm shall do the annealing.

The sheet mill hands' scale has the following addition:

12. Twelve pairs of 144 inches long and over of sheet iron to be the equivalent of 15 pairs of shorter lengths. Single iron and iron worked in pairs to be at same ratio.

To the scale for roughing and catching on sheet and jobbing mills the following note has been added:

6. When working firebed out of single slabs, 26 slabs shall constitute a heat.

The following has been added to the tin and black plate mill scale:

Shearing on Modern Squaring Shears.

Gauge.	Price.
7. 24 to 30, inclusive.....	\$1.30
31 to 32, inclusive.....	1.50
33 to 34, inclusive.....	1.70
35 to 36, inclusive.....	1.90

8. All sheets rolled on tin mills over 14 square feet shall be paid for at sheet mill prices.

9. Where improved squaring shears are used, the company shall pay for grinding the knives.

Output.

The limit of a turn's work of eight hours shall be as follows:

On gauge.	100 pounds.
No. 24.....	6,400
No. 25.....	6,000
No. 26.....	5,600
No. 27.....	5,400
No. 28.....	4,900
No. 29.....	5,100
No. 30.....	5,000
No. 31.....	4,800
No. 32.....	4,600
No. 33.....	4,400
No. 34.....	4,200

Where 28 gauge is worked matched eight sheets to the pack, 5400 pounds shall be the limit.

To the sheet and tin bar scale has been added a scale for heating, based on 56.7 cents per ton on a 1.5-cent card rate.

The following tin house scale is new:

Tin House Scale.	Per box.
	Cents.
Tinning and washing, coke, terne and charcoal.....	12
Tinning and washing, double rolling.....	15
Tinning and washing, heavy coated terne.....	16
Tinning and washing, old style.....	18
Assorting, coke, charcoal and terne..	4
Assorting, double rolling.....	5
Catching, coke, charcoal and terne..	4
Catching, double rolling.....	5
Drawing, old style.....	6
Listing, old style.....	4 1/2
Turning down, coke and terne.....	4 1/2
Turning down, charcoal.....	5

NOTES.

- Boys to turn down all plates worked endways.
- No assorter shall assort for more than three stacks.
- Standard to be 20 x 14 of 112 sheets to the box.
- All boxes weighing over 136 pounds shall be counted as gains.
- The output of each set shall not exceed 200 boxes per week.

The scale for structural mills has been changed, the first being on a 23-inch instead of a 20-inch mill. The scales in universal plate mills have been dropped. The new scale reads:

Structural Mills.

These scales are based on a 1 1/2-cent Western Iron Association card, and the prices paid all men working thereon advance 2 per cent. for every additional 1/10 cent advance of said card, and 2 per cent. decline for each deduction of 1/10 cent from said

card, but not to go below the price herein specified on a 1½-cent card.

	Price per ton, 2240 pounds. Cents.
22-inch mill.	
Heater, output of one furnace.....	46
Heaters' helpers, output of one furnace, three each.....	21
Piler and charger, output of mill.....	8
Second pilers and chargers, output of mill, three each.....	6
Buggyman, output of mill.....	8
Roller.....	26
Catcher.....	13½
Rougher down, output of mill, two each.....	11
Rougher up, output of mill, two each.....	10½
Hookers, front, output of mill, two each.....	9
Hooker, front, second, output of mill.....	7
Hookers, back, output of mill, two each.....	8
Hooker, back, second, output of mill.....	7
First straighteners, two each.....	8
Second straighteners, two each.....	6
Shearman.....	9

1. On piles, 900 pounds to 1200 pounds, one extra man to be furnished by the company on each hook; piles from 1200 pounds to 2000 pounds, two extra men on each hook shall be furnished.

2. Ten per cent to be deducted from all unfinished iron for crops.

3. The above rates are predicated on 50 tons output on three furnaces or less, and in order to be adopted by any mill the system in full must be followed.

	Price per ton, 2240 pounds. Cents.
Eighteen-inch mill.	
Heater, output, one furnace.....	50
Heaters' helpers, output, one furnace each.....	20
Roller, output of mill.....	35
Catcher.....	22
Rough down.....	18
Rough up.....	16
Pilers and chargers, each.....	8
Buggyman.....	9
Hookers, each—front.....	9
Hookers, each—back, one extra to spell front and back.....	8
First straighteners, each.....	8
Shearman, each.....	9
Shearman's helper.....	7

Ten per cent. to be deducted from all unfinished iron for crops.

The above rates are predicated on 40 tons output on three furnaces or less, and in order to be adopted by any mill the system in full must be followed.

There has been no change in the rod mill scale, in the journeyman roll turners' scale or in the scale for spike cutting.

#### A Steam Lifeboat.

The National Lifeboat Institution of Great Britain is having built for it, by Messrs. Green, the Thames boat builders, a new steam lifeboat which possesses some entirely novel features. The "City of Glasgow," which is her name, was designed by E. L. Watson. She is 53 feet long over all, 16 feet beam and 5½ feet deep. The loaded draft is 3 feet 3 inches, at which she will have a displacement of 30 tons. In this condition she would carry 30 to 40 passengers in the after part, 4 tons of coal in the bunkers and half a ton of fresh water in the tanks. The "City of Glasgow" is larger than any previously built lifeboats, and her machinery is different. The vessel is jet propelled, but in addition to having two jets for forward propulsion and two for after propulsion, the "City of Glasgow" is able to throw a jet from the broadside which will give lateral propulsion and enable the lifeboat to throw herself broadside off a ship. This is a great gain, for the lifeboat is oftenest in imminent danger of being dashed to pieces against a ship. There are two vertical turbines for throwing the jets by which the vessel is propelled in any way, and these are driven by a compound engine of 200 I. H. P., working a horizontal shaft on which are the turbines. The

duplication of turbines and placing them vertically is new. There are two funnels side by side. The speed expected is over 10 knots. The boat is to be stationed at Harwich, north of the entrance to the Thames River.

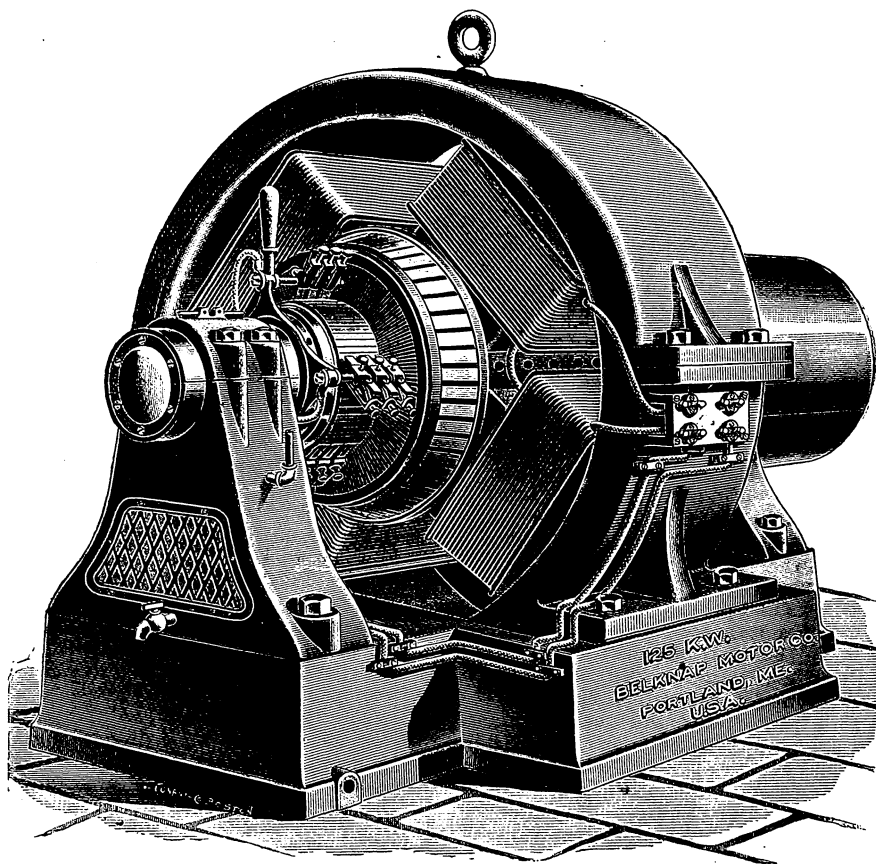
#### The Belknap Multipolar Generator.

A new multipolar generator built by the Belknap Motor Company of Portland, Maine, which we illustrate, has the frame of the machine composed of several parts in order to promote convenience in handling. The total weight is quite uniformly divided between the several parts, as shown in the cut, making a very convenient machine to set up in stations which are not provided with apparatus for lifting

located at opposite sides of the machine to avoid the danger of a short circuit. The field cores are compound wound, and the magnet circuit of the machine is carefully designed with reference to the reluctance of cast iron, wrought iron and air, so as to get the best effect from the materials involved.

#### Manual Training at the Pratt Institute, Brooklyn.

Some highly creditable specimens of the work done by the students of the Trade School and of the Technical High School Department of the Pratt Institute, Brooklyn, were shown at the annual exhibition of the institute, held on May 31, June 1 and 2. Manual training is a regular part of the three



THE BELKNAP MULTIPOLAR GENERATOR

heavy weights. The bed is planed to fit iron slides, and is very rigidly constructed so as to withstand the strain brought on it by the weight of the field magnet. The magnet consists of two iron castings, the two together forming a complete circle, with four inwardly projecting cores to receive the field cores. The magnet is bored and fitted with a pole bushing surrounding the armature, which gives the greatest possible effective arc and prevents the disagreeable humming sometimes observed with toothed armatures under heavy loads, and suppresses the tendency to spark by reason of stray lines of force. The armature is of the toothed hollow drum type. By a system of end connections the crossing of the conductors at the leads of the armature is avoided, thereby reducing the danger of burn-outs, and every wire can be got at conveniently. The commutator is massive, and the Belknap wire and graphite brushes are used. The bearings are very large and are self aligning and self oiling. The two terminals are

years' High School course provided for the male scholars of the Pratt Institute, and, while it is not intended to prepare them for any particular mechanical pursuit, as is the case in the regular Trade School of the institute, it serves to give them manual dexterity and a valuable insight into several mechanical pursuits. In many cases this elementary knowledge is found to induce a taste for a particular trade, which is followed up by more specific studies in the same line and the eventual adoption of such trade as the life work of the pupil.

The course of manual work, which runs concurrently with the academic curriculum, consists in the first year of instruction in bench work or practice in the use of the principal wood working tools, turning, pattern making, and metal spinning. This is followed in the second year by practice in molding, tinsmithing and forging, the third and last year of the course being devoted to instruction in vise and machine tool work, which includes the more exacting operations of the machinist. The course

ends with the construction of some object, such as a small dynamo, motor, or steam engine. In the recent exhibition were shown some very excellent specimens of such construction, which received high commendation from the visiting experts. The pattern making exhibits included some examples of complicated and highly finished objects made by the students, together with the castings made from the same.

The forged iron work exhibited was especially creditable and tasteful, and showed how a remarkable degree of dexterity can be attained by intelligent students within a comparatively short time, provided the quality of instruction is good. This exhibit included some artistic iron work in the shape of grilles, brackets, lamps, door knobs, hinge straps, &c., which would compare favorably with any of the modern art iron work. A great deal of the work was original, displaying both imagination and taste on the part of the students and embodying correct principles of design.

All the instruction given in the school appears to be very systematic and thorough, instilling both theory and practice into the minds and hands of the pupils. That of the forge shop, for example, embraces a comprehensive course in drawing, bending and welding different forms in iron. It ends with the forging and tempering of a set of steel lathe tools, to be used in the shop work of the following year. The bench work in iron of the third year comprises chipping, surface filing, straight, angular and round fitting; and the making of calipers, try squares and inside and outside gauges in sheet steel, followed by practice in plain and taper turning and fitting, screw cutting, &c.; and finally a set of taps, twist drills and reamers is made and finished. The whole course is accompanied by oral instruction to the classes in the fundamental principles that govern the various operations.

Furthermore, instruction is given to those who desire it in geometry, physics, chemistry, electrical construction, steam and the steam engine, strength of materials and machine design, as well as in mechanical and architectural drawing. These subjects are taught by means of lectures and by class room and laboratory work.

The regular Trade School of the institute imparts instruction by practical mechanics to those desirous of learning definite trades. Carpentry, machine work, plumbing and house, sign and fresco painting are the branches now taught, and each of these trades made a very excellent showing as the result of their past season's work. Prof. C. R. Richards, director of the Department of Science and Technology of the institute, has brought this branch of educational work up to a high state of efficiency. The value of such an establishment as the Pratt Institute is incalculable.

Floods have been doing immense damage in the far Northwest. In many parts of Colorado, Oregon and Washington business was practically suspended and inter-communication cut off at the close of last week. Considerable loss of life is also reported, and several mining towns have been actually washed away. The devastation in British Columbia, where the Fraser River overflowed its banks, is reported as being widespread. All farming operations for this season will be stopped and great trade depression in that section is looked upon as certain during the rest of the year.

## A Visit to a Stove Foundry.

A modern stove foundry is a very complex institution. According to a high authority no less than 25 trades are represented in such an establishment. They comprise designers, modelers, wood pattern makers, plaster workers, iron pattern makers, polishers, electro platers, buffers, carpenters, follow boarders, japanners, casting scratchers, floor molders, bench molders, cupola melters, grinders, mounters, inspectors, tin-smiths, sheet iron workers, brass workers, blacksmiths, flask makers, pipe fitters and machinists. These are by no means forced classifications, with groups of workmen who are sometimes craftsmen of one sort and then of another. Every man employed has a special function in which he is as far as possible an expert. Such an explanation is a necessary preliminary to a description of the art of stove founding as conducted according to the most approved methods of the day. For this purpose the works of The Michigan Stove Company, at Detroit, Mich., have been selected. They are the largest manufacturers of stoves and ranges in the world, having enjoyed that distinction for several years, and are famous for the originality of their designs as well as for the enterprise with which they have developed marked improvements and artistic decorative features.

Before entering upon technical details, a brief history of The Michigan Stove Company will be of interest, as showing the origin and growth of the establishment which now occupies so prominent a position in the stove trade. The organization of the company dates back to 1871, when articles of incorporation were taken out by Charles DuCharme, Jeremiah Dwyer, Merrill B. Mills and R. H. Long. The central figure in this group of persons was Jeremiah Dwyer, who was the pioneer stove manufacturer of Detroit, having founded in 1862, before the incorporation of any of the present Detroit stove companies, the firm of J. Dwyer & Co., exclusive manufacturers of stoves and ornamental castings. In his career as a manufacturer Mr. Dwyer was so conspicuously successful in grasping the possibilities of the stove trade, and so thoroughly alive to the education of the public taste in favor of finer goods, that he was earnestly solicited to become a member of the new company when it was projected in 1871. Although the condition of his health had caused him to retire from active business, he yielded to persuasion and was made manager of the enterprise. Ground was broken on the present site of the works in March, 1872, and the first heat was taken off in the foundry on September 12 following. The officers of the company at that time were as follows: Chas. DuCharme, president; M. I. Mills, vice-president and treasurer; Jeremiah Dwyer, manager; R. H. Long, secretary. In 1873 George H. Barbour was elected secretary to succeed Mr. Long, who became superintendent, holding that position until his death on April 3, 1876. Charles DuCharme died January 9, 1873, and was succeeded as president by Francis Palms, who held the position until his death in November, 1886. In August, 1872, M. B. Mills became associated with the company and was elected a director in 1878. Charles A. DuCharme entered the company in 1879 and became a director in 1882, when he was also made purchasing agent. The Chicago house was established in January, 1879. On Jan-

uary 1, 1882, Frederic W. Gardner became associated with the company, assuming the management of the advertising department and Western business. The officers of the company at present are as follows: Jeremiah Dwyer, president; George H. Barbour, vice-president and general manager; Merrill B. Mills, treasurer; Charles A. DuCharme, secretary; William A. Dwyer, purchasing agent; William J. Keep, superintendent; Frederic W. Gardner, Chicago, Western manager. The present directors are as follows: Jeremiah Dwyer, George H. Barbour, Charles A. DuCharme, Merrill B. Mills, Francis F. Palms, William A. Dwyer, Edwin S. Barbour 2d, M. W. O'Brien and Frederic W. Gardner. The capital stock of the company was originally \$100,000, and was increased at various times until it is now \$300,000, but the actual investment in the business is about \$1,000,000. The pay roll in 1892, which is taken as an average year, was \$595,974, and 75,699 stoves were made, among them being no small, cheap stoves, but all of large size and high grade. The quantity of pig iron melted in that year was 11,632 tons. The average number of men employed is 1200, and they are kept at work as far as possible every working day in the year to secure the best economical results.

Coming to the methods of manufacture pursued in this establishment as typical of modern practice, the starting point is naturally in the designing room. The high class stoves of to-day not only require the most expert workmanship in their construction, but they compel the employment of creative genius of a peculiar character. Artistic talent must be united with practical ideas. An ideal stove designer is not only an artist in the use of pencil, clay and plaster, but he must also thoroughly appreciate the special use to which his work is to be put and not lose sight of the useful when allowing his fancy to play on the ornamental. The designing room is therefore more than a mere studio. There is a rigorous course of procedure followed which here unites the canons of art with practical affairs. The first step taken is to decide upon the internal construction, arrangement and size of fire pot, grate, flues, oven or heat chambers, dampers, ash pit, &c. The demands of the trade, as gathered through salesmen or direct from consumers, may govern many of these points, or they may have been settled by practical tests instituted for the purpose. Every point in this direction having been covered, the designer comes forward to prepare the shell or overcoat. He makes a flat drawing of about one quarter size, in which the shape, proportions and ornamental features are set forth in sufficient detail to enable his ideas to be clearly grasped. The design is then subjected to severe criticism by experts, and it may be found that a most striking design which would make a very effective piece of stove architecture is impracticable on account of excessive difficulty in reproducing it in cast iron. The question of cost cannot be wholly ignored in making stoves even of the highest grade. The design having been approved as drawn or modified, it is then enlarged to the full size of the stove and further criticised. This will probably bring about numerous changes. The next step is to prepare a full-sized clay model. For this purpose a shallow wooden trough is made of the proper width and length for the side of a

stove and having the sides beveled to the exact miter. In this trough a perfect reproduction of the accepted drawing is made in clay, requiring great skill and artistic taste. Tops and bases are handled in the same way.

From the clay models plaster casts are made which, when completed and their surfaces blackened, are set up in the semblance of a finished stove. More criticism follows and perhaps much of

description of stove molding is from the pen of Superintendent Keep:

Stove castings are made in two-part flasks, consisting of cope and nowel, hinged at the rear. The pattern is so made that the cope can be rolled off, without loosening with wedges if possible, and give a clean lift (no rats), and bars with nails driven in them are so located as to anchor every hanging core. No separate cores, green or dry, are used in stove work, and the size of the flask leaves only 1 inch of sand outside the edge

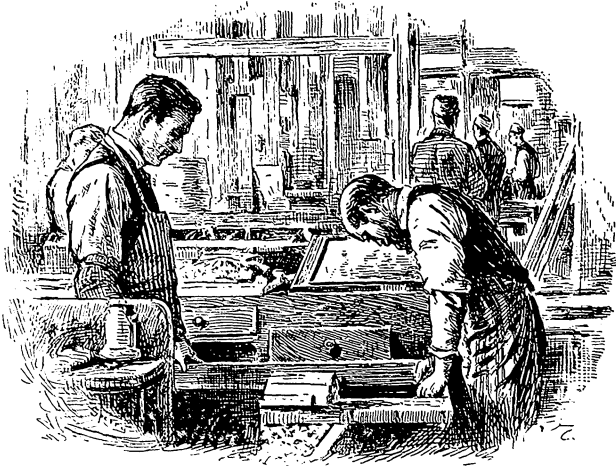
old leather belting. If the casting is to be run from the edge, iron set gates are placed against the edge of the pattern on the follow board and molded in the nowel.

The parting sand having been blown off, the cope is placed on the nowel and clamped in place, and sprues are placed in position. Flat sprues are set on the pattern, bottom side up. Sand is now shoveled in, and with the hands is tucked under the bars and around the sprues, the flat ones being turned over. The cope is then filled with sand and rammed, the superfluous sand being brushed off. The cope is then rolled off, and rests on its hinges and on a box placed in the rear. The sprues are drawn out, and the inner opening is trimmed with a slick to prevent loose sand breaking off with the inflowing iron. The pattern is now withdrawn, and if there are any imperfections in the mold they are repaired. Heavy facing is shaken over the mold, and when the cloud has settled, light facing is shaken over this, both from muslin bags. The pattern is now printed back, the set gates are withdrawn, and the pattern is removed.

The heavy facing is to prevent the iron burning the sand and to give a smooth surface and a good color. The light facing is simply to prevent the pattern from sticking to the heavy facing. If any heavy facing should stick, it would leave a rough spot—if too much light facing is used it will wash and run before the iron and will make a worse surface than sticky heavy facing.

The mold is now closed and clamped exactly as it was when rammed up.

The snap floor, which is claimed to be the finest in the world, extends almost the full length of one side of the foundry. It is intended for molding small pieces. For this purpose snap flasks are used. These flasks are made with hinged sides, fastened by a hook or snap. After the sand has been rammed in place and the pattern removed, the flask is unfastened, taken off and used with another pattern. The sand retains its position for a small casting without the support of the flask. In this way a comparatively few snap flasks form an equipment for a large floor, avoiding the investment of capital in numerous flasks. Large pieces, however, must be molded in stationary flasks, as previously described. These are laid out in floors from 7 to 9 feet



*A Corner of the Wood Pattern Shop.*

the work is condemned and must be tried again. Thus the design goes forward slowly. The more elaborate parts are now transferred to wood. Wooden blocks of suitable size are carved into an exact representation of the design. According to old methods these blocks would be hollowed out on the reverse side to the proper thickness for patterns and be used as such—a very expensive as well as unreliable process. By the improved method of The Michigan Stove Company a wax impression is taken from the carved surface and it is used in the preparation of a special metal pattern, composed of lead and tin, cast with the usual allowance for shrinkage in the subsequent stove castings. A durable pattern is thus secured which will admit of any kind of rough handling and will not warp when stored away. These special metal patterns are used for the most ornamental or intricate parts of stoves. Wood patterns are made for the plainer parts, as they can thus be more easily and less expensively produced or duplicated. Iron patterns are copies of the special metal and wood patterns. They are finished in the iron pattern shop after they have been cast from the originals. To expedite work in the foundry it often becomes necessary to have a considerable number of patterns of some one part. The equipment of a metal pattern shop consists mainly of vises and files. Surfaces are here made as smooth as glass and abutting edges are fitted together precisely. A small brass foundry is often a necessary adjunct, as holes in the iron patterns are closed with brass, defective edges are filled and straightened and additional pieces are sometimes brazed in place. The pattern department of a large stove works is one of the most expensive in the whole establishment, as will be inferred from the foregoing statements. The pattern expenditure of The Michigan Stove Company for 1892 was very nearly \$50,000.

The work of preparation being thus set forth, the patterns will be followed to the foundry. Here, under one roof, all the molding is done. The following

of the pattern. Stove patterns are of iron filed as smooth as possible, and waxed to prevent rusting. They are boarded face up, that is, fitted to a wooden follow board to give the under side a bearing to prevent breakage, or springing by ramming.

The follow board has wooden cleats on the back, which are bedded in sand on the molding floor, that it may lie perfectly solid. All dust and moisture are brushed from the pattern, as the slightest rust will make a rough surface on the casting. The nowel, which has no bars, is placed on the follow board and sand is riddled through a No. 12 sieve, to lie  $\frac{1}{4}$  inch deep on the pattern. Then sand from the heap is shoveled to fill the flask. This is rammed and leveled off with



*View in the Molding Shop.—Ramming Sand in Flasks.*

a straight edge. Sand is thrown over this and a bottom board is rubbed down to give a true bearing surface. This bottom board has holes in it to allow gas to escape.

Iron clamps are placed on each side and the box is rolled over, allowing the cleats of the bottom board to rest on a sand leveled floor.

The follow board is then lifted off, leaving the pattern buried in the sand. If the parting line is not firm, the molder presses sand with thumb or trowel until the edge of the pattern makes a perfect parting with the sand. Parting sand, which is burned molding sand, is thrown over the whole surface, and what has fallen on the pattern and any superfluous quantity is blown off with a bellows.

The parting is made by the close fitting of the follow board to the pattern, and any crooked corners are built up with pieces of

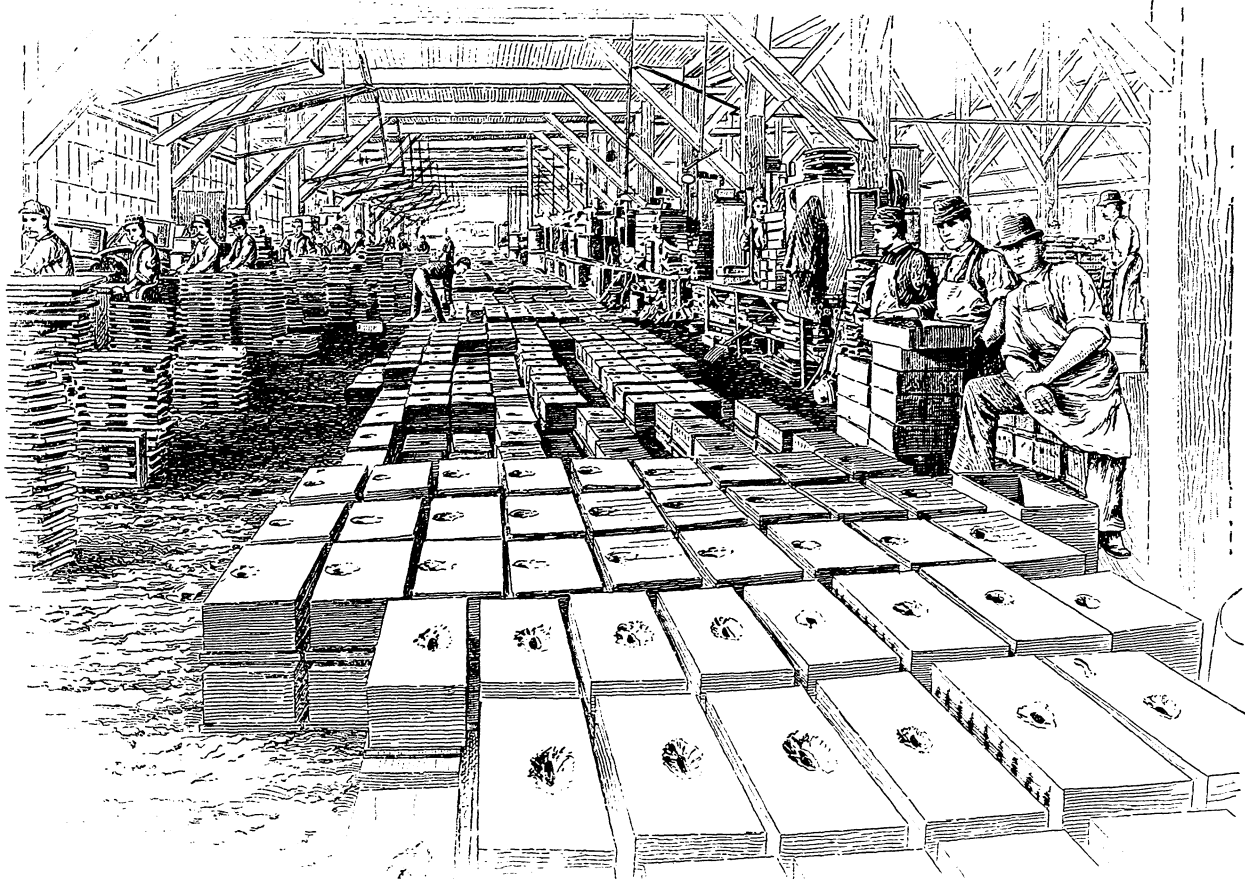
wide and about 28 feet long, holding two or three rows of flasks, with one molder to each floor.

The process of casting is very interesting. Two cupolas are in use, located some distance from each other, so as to be convenient to all parts of the molding shop. These are cylindrical in form, built with iron shells and fire brick linings, one being 6 feet 8 inches in outside diameter and the other 6 feet. In these alternate layers of coke and pig iron have been dumped from an elevated platform. After they have been fired, the heat is intensified by a blast of air from a huge blower in the engine room, connected with the cupolas by under-

ground pipes. This operation is so timed that the molten iron will be ready for pouring when the molders have completed their work of preparing the molds. The cupolas are supported on

molds. Here a helper with a suitable implement skims the slag or oxidized metal from the top of the ladle, so that only the pure stream of iron flows into the pouring hole in the mold. If

be supposed that some better plan could be adopted than that of carrying the ladles by hand to all parts of the foundry. Labor-saving devices have been tried in stove foundries, but have



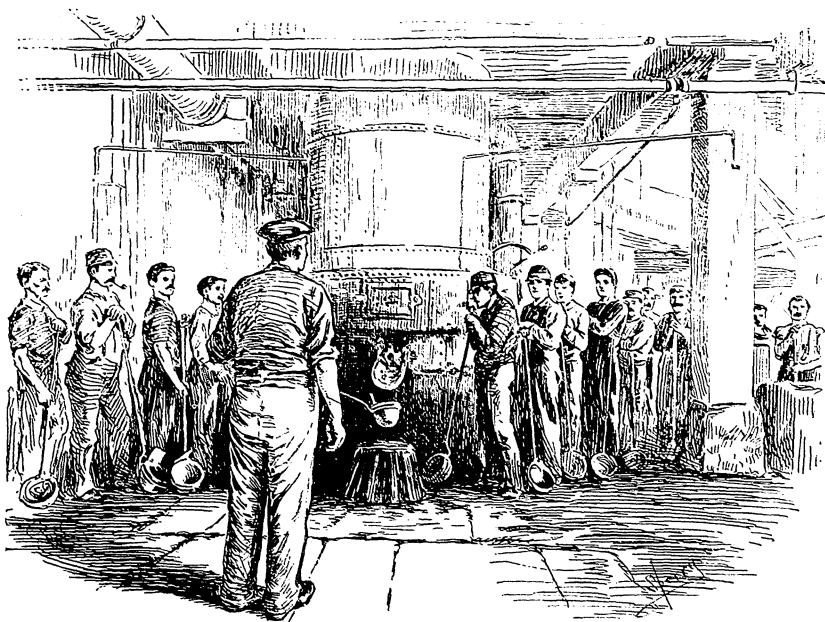
*East Snap Flask Shop.*

posts of a proper height for drawing the metal from the bottom into hand ladles. Everything being in readiness, the molders gather in regular lines with their long handled ladles to receive the

the castings are small, the molder flits rapidly from one to another mold, leaving but part of the contents of his ladle in each. If the castings are large, several molders may

been abandoned as less satisfactory than the hand ladles. An enormous amount of metal is carried in this way. The two cupolas referred to melt an average of 67 tons per day, their output having run up as high as 71 tons 13 hundred-weight. The men all work here by the piece, every effort being made to help them to earn as much as they can, because in this way will the company also make the most money.

Mr. Keep uses in this foundry his well-known test of cast iron, by which uniformity in results is secured. An iron follow board is used, with gated patterns of a square and flat bar. On this board are placed a pair of yokes, with parallel chilling surfaces  $12\frac{1}{2}$  inches apart. The ends of the bars run against these surfaces when poured. The yokes and bars are then taken out of the sand, carefully cleaned and placed on a measuring table, which is a counterpart of the follow board, with openings through it at both ends of each bar. The bars and yokes are placed on it exactly as they were in the mold. The shrinkage of the bars from the yokes is then measured with a graduated steel wedge or gauge measuring  $\frac{1}{16}$  inch. This will show whether the shrinkage is too great or too little, and whether the iron used contains too little or too much silicon, when the proper remedy can be applied by changing the mixture of iron at the cupola. The same bars are used for making tests of transverse strength and for ascertaining the depth of chill. These tests are carefully and very regularly made, so that the utmost precautions can be taken to insure sound, strong and perfectly fitting castings.



*Ready for Casting.—No. 1 Cupola.*

liquid iron. The blast is checked, the plug is knocked out of the tap hole and the fiery stream flows down a short spout to be caught by one ladle after another and carried to the different

at the same time pour from their ladles into the one mold. When the ladles are empty they hasten back to have them refilled until the molds have all been properly attended to. It might

Small quantities of aluminum are also used in the cupola mixture, as that remarkable metal is found to impart beneficial properties to iron, making it pour more smoothly, preventing blow holes and making castings less liable to break.

From the foundry the castings go to the scratch room, where the large pieces are cleaned by hand with steel wire brushes and the smaller pieces are cleaned in air-tight tumbling barrels from which the dust is exhausted by a large fan. The tumbling barrels are large horizontal cylinders strongly made of cast iron. A portion of the shell is removable, for the purpose of putting castings in and taking them out. On account of the great weight of barrels and contents they are operated by cogged gearing. The cleaning room is located so as to be easily reached from all parts of the foundry. From this point two routes are taken by the different classes of castings. By one route the plainer portions pass to the mounting shop, while by the other route the pieces to be ornamented, japanned or nickeled pass forward until they meet the finished stove in the inspecting room. A system of shelving has been constructed as an adjunct to the scratch room, with a separate rack for each kind of casting large enough to hold the number of pieces made in four days. In the mounting shop a sufficient space is allotted to each man to assemble the parts of a stove, which are brought from the shelves in truck loads. He has graded emery wheels, driven by power, for grinding edges, at which either he or an assistant finishes the castings so as to make them fit nicely in their places. All doors and close joints are fitted with files. In modern high class stoves this work is very essential. Joints must be perfect, in some instances a watch-case fit being required. The castings which are taken by the other route go to the

done. Polishing follows the grinding. This is accomplished with very fine emery wheels and bull neck wheels made of heavy leather. No belts are here used for polishing, as it has been found that better results are obtained with wheels. Parts to be japanned are taken to the japanning department, which contains a complete equipment for applying the durable glossy coat. They

to the nickel packing room and from there to the general inspecting room, where decorated parts meet the completed stoves from the mounting shops. Crating with wood next follows, after which the stoves are either shipped or stored in the warehouses to await the demands of the trade.

A peculiar feature of the stove business, in which it is unlike almost any



*In the Polishing Room.*

then go to the gilding, ornamenting and striping department. The parts to be nickeled receive much more elaborate treatment. They are placed in tanks and scrubbed with potash and hot water, then with pumice stone, after which they are washed in hot water and lastly with cold water, when they are ready for the nickel bath.

The nickel plating department of this establishment is on an unusually large

other manufacturing industry, is the practice of furnishing repairs or new pieces for any part of a stove. As there are from 75 to 300 separate pieces in every high-class stove, and such stoves are made in a variety of styles and in a number of sizes, requiring an immense number of special castings, it will be seen that the furnishing of repairs is a most intricate matter, requiring elaborate arrangements in order to conduct it satisfactorily and economically. The Michigan Stove Company's system is very complete. In the basement of their main building, and overflowing into an extension which was found necessary, are an enormous number of racks, laid off in aisles, built up to the ceiling, and all numbered and indexed, in each of which are stored parts of stoves. This part of the establishment is appropriately christened "the catacombs," as it is a perfect labyrinth of passages in which it would be an easy matter for a visitor to lose himself. The racks are constructed so as to hold a certain number of pieces, and whenever one becomes nearly empty orders are sent to the foundry for more castings of the same pattern. From this stock any part needed to repair any stove made by the company from the beginning of the business can be furnished instantly, or all the parts essential to the construction of a stove of a particular pattern can be easily assembled.



*In the Grinding Room.*

grinding and polishing room, in which there are emery wheels of many sizes and shapes. Some of these wheels have convex surfaces to work in indentations, while others have concave surfaces to work on curved castings. These wheels are made on the premises, so many being used that a special department was formed for the purpose. Circular wooden blocks constitute the centers. A heavy coat of strong glue is applied to them, after which they are covered with ground emery of varying degrees of fineness, according to the work to be

scale to meet the requirements of the company's business. Special dynamos furnish the electrical current necessary, and about 6000 gallons of solution are in constant use.

After remaining in the nickeling tanks a sufficient time the castings are taken out and dried, when they pass to the buffing room, in which the wheels used are made of Spanish felt. This imparts the very high polish that is a conspicuous feature of nickeled work. From the buffing room, after the pieces are carefully inspected, the next step is

With the view of rendering the great Paris Exposition of 1900 still more imposing, a project is on foot in France to deepen the river Seine, so as to allow vessels of heavy draft to ascend to the French Capital. A scheme has been drawn out and a special commission has been appointed by the Chamber of Deputies for its consideration. If it is found advisable the necessary authority will be given for putting the work in hand at once.

A tract of 50 acres of land at Perth Amboy, N. J., has been purchased by the firm of Guggenheimer's Sons from the Easton & Amboy Railroad Com-

pany. The firm, who control extensive silver and copper mines in Colorado and Michigan, are about to erect on the property a \$1,000,000 plant for smelting and reducing their ores, giving work, it is estimated, to about 1000 men. The land acquired is on the east shore of Staten Island Sound, north of Perth Amboy, with a water frontage of 750 feet. Construction of the plant, with the necessary wharves and piers, will, it is announced, be begun at once. The company will run a line of ore steamers between Perth Amboy and Mexico.

## Replies to Tariff Questions.

The Broderick & Bascom Rope Company of St. Louis report that their sales of wire rope were \$480,000 in 1889, \$540,000 in 1890, \$617,000 in 1891, \$703,000 in 1892 and \$714,000 in 1893. They import all their steel wire and state that they paid for No. 12 wire gauge in 1884 at 32 shillings and 6 pence per hundredweight, Liverpool; in 1890 at 20 shillings and 6 pence, in 1892 at 18 shillings and 6 pence, in 1894 at 17 shillings. On finer sizes there were greater reductions.

Referring to prices for wire rope, they say: "In 1884 wire rope sold at 30 per cent. discount, steel ropes 25 per cent., street railroad cable 13 to 16 cents per pound, net, according to locality. In 1890 iron and steel ropes sold at 45 per cent. discount, cable ropes at 12 cents per pound, net, all delivered at destination. In 1892 iron and steel ropes sold at 50 per cent. discount and cables at 11 cents per pound, net, delivered at destination. In 1894 iron and steel ropes sell at 50 per cent. discount and cables at 10 cents per pound, net, delivered at destination."

Hazard Mfg. Company of Wilkes-Barre, Pa., report their output of wire and wire rope as follows:

Year.	Tons.	Value.	Year.	Tons.	Value.
1884....	1,838	\$275,074	1889....	2,527	\$501,529
1885....	1,463	271,702	1890....	2,372	597,253
1886....	1,573	317,895	1891....	2,613	546,669
1887....	1,923	372,150	1892....	2,783	591,393
1888....	1,684	369,473	1893....	3,161	646,934

They say: "We have not been running less than full time during the past two years; on the contrary, have made considerable overtime. In fact, we have made much overtime for five years past, due to the high quality of our product."

Referring to the present duty on rope they make the following interesting statement: "The actual duty on the rope itself averages only about 29 per cent., as shown in the following custom house statement of duties on an invoice of wire rope recently imported:

Six Thousand Feet,  $\frac{5}{8}$  inch Diameter, Bright Steel Wire Rope, 19 Wires, 6 Strands, &c.  
1 ton, 12 cwt., 12 pounds, at 32 shillings per cwt. \$249.74  
Value of wire, per cwt., at 26 shillings per cwt., \$203 12, duty at 45 per cent. 91.40  
Total gross weight of rope, 3596 pounds, duty at 2 cents..... 71.52

Total amount of compound duty..\$163.32

"You will notice that of 66 per cent. duty paid by the rope, upward of 36 per cent. is on the wire and but a trifle over 29 per cent. on the rope proper."

Wickwire Bros. of Cortland, N. Y., manufacturers of wire cloth and wire goods, say:

"From 1875 to 1880 our production was small. Since then the number of square feet of wire cloth produced each year has been as follows:

1880.....	3,432,000	1887.....	16,195,000
1881.....	4,657,000	1888.....	21,353,000
1882.....	4,257,000	1889.....	21,533,000
1883.....	6,286,000	1890.....	22,075,000
1884.....	6,580,000	1891.....	28,174,000
1885.....	8,400,000	1892.....	30,131,000
1886.....	12,227,000	1893.....	37,268,000

"Wire cloth made into wire goods will show about 10 per cent. additional to above figures each year. We cannot give exact figures on these goods, as we haven't them. The wire cloth is 75 per cent. of our production in quantity and value.

"Wholesale prices of painted wire cloth have been as follows: Fine wire, No. 33 gauge, in 1884, 8 cents per pound, \$1.80 per 100 square feet; 1890, 7 cents per pound, \$1.40 per 100 square feet; 1892, 6½ cents per pound, \$1.35 per 100 square feet; 1894, 6½ cents per pound, \$1.30 per 100 square feet."

The Erie Malleable Iron Company of Erie, Pa., manufacturers of malleable iron castings, say: "Our yearly value of production for years ending on June 30:

1881.....	\$46,229.65	1888.....	\$144,320.62
1882.....	107,141.07	1889.....	146,059.90
1883.....	161,554.84	1890.....	199,537.17
1884.....	123,942.84	1891.....	321,883.94
1885.....	75,850.34	1892.....	310,313.48
1886.....	83,988.88	1893.....	294,844.70
1887.....	129,303.42	1893 (to December 31)	100,964.21

"The product consists of malleable and gray iron castings to order, no special-

per week, because of lack of orders, apparently caused at first by the financial stringency and continued of late, we think, by uncertainty about tariff legislation. The average wholesale price for the year 1884 was 6 006 cents per pound; 1890, 4 749; 1892, 4.23; 1893, 4 273; December, 1893, 4 167. This last is since recent reductions in prices. The average does not always denote exactly what it seems; for instance, the average price for the year, in 1893, was higher than in 1892, but some of the prices were lower in 1893, and none were higher than in 1892, the higher average being from making a larger proportion of the higher priced castings in 1893 than in 1892. A fairer comparison might be to take a particular class of castings and compare, say carriage castings, price, 1884, 5½ cents; 1890, 4½ cents; 1892, 4½ cents; 1893, late contracts, 4 cents."

The Standard Mfg. Company of Allegheny, Pa., manufacturers of cast iron enameled ware, have the following annual output:

1883.....	\$150,637	1889.....	\$345,078
1884.....	154,371	1890.....	405,005
1885.....	188,991	1891.....	459,790
1886.....	235,046	1892.....	500,351
1887.....	274,997	1893.....	523,200
1888.....	268,073		

The Ellis & Lessig Steel & Iron Company of Pottstown, Pa., manufacturers of muck bar, nail plate and cut nails, report their production during the past nine years as follows:

Year.	Puddle or muck bars.		Nail plate.		Cut nails.	
	Tons.	Value.	Tons.	Value.	100-pound kegs.	Value.
1885.....	2,396	\$61,500	4,060	\$133,000	83,688	\$187,000
1886.....	7,485	197,200	9,825	332,000	199,468	462,000
1887.....	9,204	260,000	11,646	419,000	229,939	532,000
1888.....	10,070	262,000	13,725	446,500	258,614	552,500
1889.....	15,984	400,000	12,676	395,000	243,230	509,000
1890.....	24,842	649,000	11,168	342,500	222,130	452,500
1891.....	24,180	588,000	9,653	299,000	177,442	359,000
1892.....	23,707	536,500	12,085	339,000	231,420	423,000
1893.....	21,386	439,500	12,602	315,000	241,609	419,000

ties being manufactured. No gray iron castings have been made since 1888. Since June 1, 1893, we have been running a great portion of the time with about one-half our full complement of men, and a portion of the time only three days each week. Average domestic wholesale price, 1884, 6 to 6½ cents per pound; 1890, 4½ cents per pound; 1892, 6½ cents per pound. Competition in our line of manufacture has increased in four years prior to December 31, 1893, at least 30 per cent. by the erection of new plants and the enlargement of old ones."

The Westmoreland Malleable Iron Company, Limited, of Westmoreland, N. Y., manufacturers of malleable iron castings, report their output since 1884 as follows:

Year.	Annual output.		Year.	Annual output.	
	Tons.	Value.		Tons.	Value.
1884....	288	\$34,476	1889....	486	\$47,908
1885....	244	27,512	1890....	721	68,325
1886....	370	40,985	1891....	733	71,573
1887....	498	53,010	1892....	818	69,189
1888....	432	44,890	1893....	773	66,116

They add: "Since July 15, 1893, we have been running only four days

There was a short stoppage of nail plate mill and factory in 1891 and 1892, due to differences with workmen.

Prices have been as follows in the years named:

Articles.	1890.	1892.	1893.
Puddle bars .. per ton	\$29.50	\$24.50	\$21.50
Nail plate..... per ton	34.00	29.50	27.75
Cut nails..... per keg	2.67	1.75	1.61

The HP. Nail Company of Cleveland, Ohio, manufacturers of wire nails, produced, in value, as follows:

Year.	Value of product.
1886.....	\$741,495
1887.....	1,012,491
1888.....	1,020,656
1889.....	1,313,711
1890.....	1,416,681
1891.....	1,507,940
1892.....	1,468,520
1893.....	1,292,759

The company state that they have not run much over half time during the past two years because of no demand and ruinous prices and the universal uncertainty as to what would next happen—apprehension of something worse.

An interesting report is made by the Salem Wire Nail Company of Salem, Ohio, manufacturers of wire nails, who own two plants—one at Salem, the other at Findlay, Ohio, and have a paid in capital of \$200,000. The following is a statement of the business

of the company for each year since their organization, and up to February 15 of the current year, showing the tonnage produced, average price realized, cost of the principal raw material, steel wire rods, and difference between cost of rods per gross ton and price received for a net ton of nails:

Year.	Net tons of nails manufactured during each year.	Prices realized per net ton of average size nails.	Cost per gross ton of rods delivered at our mills. (Average cost of freight about \$1 per ton.)	Difference between cost of rods and prices realized for nails. (2,080 pounds of rods make a net ton of nails.)
1886.....	3,233	\$21.60	\$41.00	\$10.60
1887.....	9,200	68.00	44.00	24.00
1888.....	14,750	58.40	42.50	15.90
1889.....	21,670	56.40	39.95	17.45
1890.....	25,652	57.60	41.95	15.65
1891.....	33,537	50.60	38.43	12.17
1892.....	34,878	44.40	32.65	11.71
1893.....	38,867	40.52	29.80	11.22
1894 to February 15...	6,112	33.90	24.00	9.90

They add: "The \$1 per ton freight means that on domestic rods. On foreign rods our inland freights are \$4.50 per ton. From this difference we pay for our supplies, apart from wire rods, cost of labor and sales, and general expenses; and at present we have very little, if anything, left. We produce steel wire nails of all sizes, and some, but not much, merchant wire. At the commencement of our business we used foreign rods entirely. We now use only domestic rods, as we can get them at but little more than one-half the cost of foreign rods and they answer our purposes quite as well. We have exported a few nails, and still export some, but not enough to amount to much. When we have sold for export we have obtained the same prices as for our domestic trade."

Reply of McIntosh, Seymour & Co. of Auburn, N. Y.: Manufacture steam engines only and did a business for the last five years, each year as follows:

1889.....	\$113,612.60
1890.....	213,900.53
1891.....	281,384.89
1892.....	267,954.36
1893.....	313,089.51

During the last six months they have run less than full time because business was so poor.

The following interesting record of sales comes from the E. W. Bliss Company of Brooklyn, N. Y., manufacturers of presses, dies and machinery:

Year.	Domestic.	Export.	Total.
1883.....	\$334,067.69	\$60,450.65	\$394,518.34
1884.....	310,517.96	40,097.82	350,615.78
1885.....	318,953.01	35,710.84	354,663.85
1886.....	341,609.18	24,235.01	365,844.19
1887.....	403,124.40	57,046.18	460,170.58
1888.....	492,539.47	78,086.07	570,625.54
1889.....	452,352.71	61,879.38	514,232.09
1890.....	449,628.37	53,587.54	503,215.91
1891.....	416,111.80	118,388.78	534,500.58
1892.....	571,395.52	89,409.81	660,805.33
1893.....	730,231.09	60,814.40	791,045.49
Totals..	\$4,740,501.20	\$679,716.48	\$5,420,217.68

They add: "The large increase in domestic sales for the year 1893 was caused by our having taken large contracts in the year 1892 that were not completed until the following year. We have been running about one-half our force five days a week since then because of lack of orders in sufficient quantity to keep our whole force employed."

Curtis & Curtis of Bridgeport, Conn., manufacturers of pipe and bolt machinery, report value of production:

1884.....	\$15,199.55	1889.....	\$44,268.49
1885.....	15,287.75	1890.....	60,579.86
1886.....	20,452.18	1891.....	68,010.55
1887.....	24,059.23	1892.....	72,683.23
1888.....	31,545.25	1893.....	53,893.15

"Since August, 1893 we have been running only three days per week. This is the only time we have ever run short time. Reason: Less orders."

William Sellers & Co. of Philadelphia, Pa., manufacturers of machine tools, &c., report their production since 1886 as follows:

1887.....	\$519,576.07	1891.....	\$965,493.17
1888.....	528,206.08	1892.....	1,002,023.94
1889.....	732,815.01	1893.....	744,833.73
1890.....	899,659.21		

They commenced running short time September 1, 1893; since that time they have been shut down practically one-third of the time. Since January 1, 1893, the reduction of their force has been 37 per cent., and from the maximum number when running full, 46 per cent. Cause, lack of orders.

The Deane Steam Pump Company of Holyoke Mass., manufacturers of steam pumps, present the following records:

Year.	Number of pumps.	Value.
1883.....	975	\$289,000
1884.....	761	247,000
1885.....	682	254,000
1886.....	790	336,000
1887.....	718	395,000
1888.....	895	375,000
1889.....	1,023	409,000
1890.....	1,293	438,000
1891.....	1,360	465,000
1892.....	1,464	513,000
1893.....	1,337	433,000

"Run part time in 1893. On account of depression in business no sale for our manufactures."

The Medart Patent Pulley Company of St. Louis, Mo., manufacturers of pulleys, say in regard to the value of their manufactures:

1884.....	\$115,000	1889.....	\$275,000
1885.....	93,000	1890.....	328,000
1886.....	122,000	1891.....	337,000
1887.....	160,000	1892.....	372,000
1888.....	207,000	1893.....	304,000

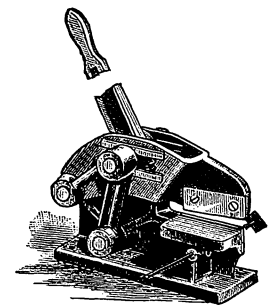
"We have been running short time during the past eight months. Previous to that we ran full time or overtime. As to wholesale prices of our goods during 1884, 1890, 1892, and the present date, we will use the value of goods in 1884 as a basis from which to figure, calling said value 100. In 1890 the price of our goods was 75 per cent. of 1884 prices; in 1892, 73 per cent., and the present price, 58 per cent. In arriving at these percentages we have averaged prices, and this information is as nearly exact as we can give it."

A suit brought by the Walker Paint Company of Cincinnati against the National Lead Company for \$50,000 damages for publishing analyses showing adulteration in the Walker Company's output has been decided in favor of the defendants on all grounds. The Court declared the charges of adulteration proven, and thereby justifying publication of the analyses as being in the interest of consumers of pure goods.

Reading (Pa.) capitalists have commenced operating the graphite mines at Pughtown, West Chester County, Pa., which were discovered and worked satisfactorily many years ago, but have been since abandoned. New shafts have been sunk.

## Core Rod Cutter and Shear.

The engraving represents a tool designed by the S. Obermayer Company of Cincinnati, Ohio, for the foundry core room or where a miscellaneous amount of cutting off and light shearing is done. It will cut round iron up to  $\frac{1}{4}$  inch in diameter, and with the gauge attached, which can be set to any length up to 15 inches, rapid work is possible. The shears are of tool steel 4 inches in length and can be readily removed for sharpening. The handle is of malleable iron 15 inches long. By reference to the engraving it will be seen that the rear ends of the two jaws are pivoted together, the upper jaw being slotted to admit the other. The two jaws are also connected by links whose lower ends are pivoted to the lower jaw and whose upper ends are provided with studs entering guides formed in the upper jaw, as shown.



Core Rod Cutter and Shear.

This arrangement gives great lever power and permits of the cutting of large pieces, considering the size of the machine, which weighs but 35 pounds.

## An Interesting Relic.

The attempt of some relic hunters to steal portions of an old boiler at Frederick, Md., has brought to light the claim of the owners and of Southern antiquarians that the boiler in question formed a part of the first boat actually propelled by steam. James Ramsey, a Maryland inventor, so runs the local statement, in 1785 conceived the idea of propelling a boat on water against the current. He devised and designed the machinery for applying steam power for this purpose, and had it forged at the old Cotoctin Furnace, near Frederick, owned and operated by Baker & Johnson. The boat was built at the Point of Rock, on the upper Potomac, and the machinery put in in the summer of 1785. The boat was worked up the Potomac to a place then called Bath, where General Washington was spending the summer. The experiment was successful, and General Washington certified that he had seen a boat actually propelled by steam at the rate of 4 or 5 miles an hour. The machinery was subsequently taken back to Cotoctin, and for two generations the boiler and the cylinder, the latter 4 inches in diameter, stood 3 feet above ground on one of the boundary marks of the Cotoctin property and Hayland, the extensive farm of William Johnson.

An order for 30 passenger locomotives for the Central Railroad of Brazil has been placed with the Brooks Locomotive Works of Dunkirk, N. Y. The order amounts to nearly \$750,000.

### New Recording Gauge for High Pressures.\*

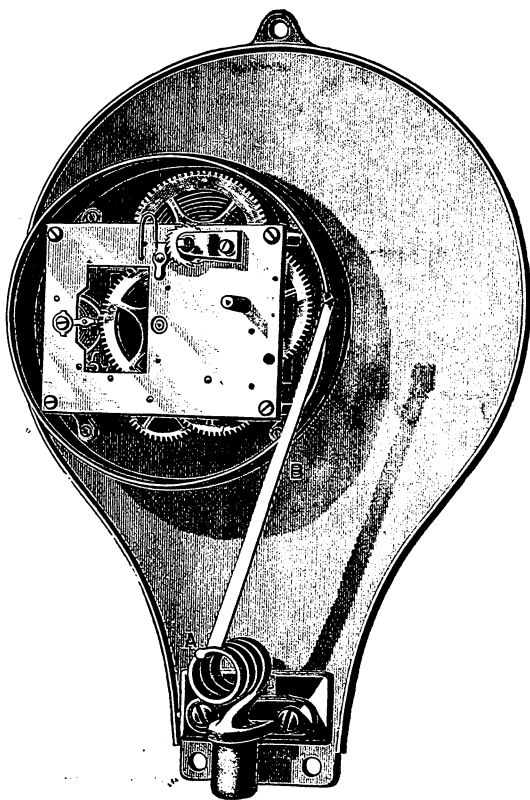
The gauge described by Professor Bristol was designed especially for high pressures, although it may be adapted to ordinary ranges. The principal object has been to produce a gauge which would withstand working pressures of 1000 pounds or more, such as are employed on oil pipe lines and hydraulic press work, without taking permanent sets and one in which the readings for increasing and decreasing pressures would be the same. The writer has had difficulty in finding an ordinary reading gauge for high ranges of pressure which has been at all reliable in these respects. In testing and standardizing high pressure gauges the most satisfactory results have been obtained with dead weights

tube is small, and as this motion is distributed through the four complete turns of the tube, it is evident that in the angular movement necessary to carry the pen arm over the scale of the chart the tube itself is not strained to a point approaching its elastic limit. By this construction the necessity of multiplying devices is entirely avoided. By varying the thickness of metal the cross section and the number of revolutions of the tube, a helix adapted to any desired range of pressure may be obtained even as low as 5 pounds per square inch for the whole scale. In the manufacture of the helical tube there is no difficulty in reproducing them to fit a standard chart.

In this instrument, as in forms of recording gauges previously described by the writer, the pen which is directly attached to the helical tube records with

triple expansion and measure 20, 36 and 52 inches in diameter by 40 inches stroke. The boilers are two in number and 14 feet long and 13 feet in diameter. The wheel is 13 feet in diameter, with 16 feet pitch. The machinery was furnished by the Cleveland Shipbuilding Company, but all the other work was done on the spot by the Chicago Shipbuilding Company. There will be but one smokestack. The cabins are finished in oak and will be as fine as any freight boat ever carried.

A new system of signaling from the bridge to the engine room will be placed in the "Kearsarge." It is operated by electricity, and consists of a box containing eight push buttons on the bridge, each one raising a card inscribed with a different order, as "Stop," "Back," "Go ahead," &c. A similar box is placed in the engine room, and a similar card is raised here when the captain gives the order. When another order is given the first card drops out of sight. When the signal is given a bell rings in the engine room to notify the engineer. Another bell rings on the bridge, showing the captain that the apparatus has done its duty. A printing mechanism is attached, recording every order, with the exact time it was given. Another wire enables the engineer to notify the captain that a mishap has occurred in the engine room. The apparatus was invented by Robert H. Gruschow of Chicago, and is receiving much approval among marine men.



NEW RECORDING GAUGE FOR HIGH PRESSURES.

carried by a cap covering an exact square inch of area. At the Stevens Institute for test work, where high pressures are involved, a cylinder and plug of accurately known cross section has been frequently employed on account of difficulty to secure reliable high pressure gauges.

The drawing shows the interior construction of a new recording gauge in which readings agree perfectly for increasing and decreasing pressures, over the entire scale. The spring part of the gauge consists simply of a Bourdon tube of flattened cross section, wound into a small helical form of four complete revolutions. One end of the tube is rigidly fastened to a bracket with an opening for the pipe communicating to the gauge, and on the end, free to move by application of pressure, a pen arm, B, is directly secured. The diameter of the helical coil being only 1 inch the actual motion of the free end of the

ink on a chart revolved by a clock movement, once in 24 hours.

This gauge is the joint invention of E. H. Bristol and the writer.

### A New Chicago Steamship.

A steel freight steamship, named "Kearsarge" in honor of the famous old war vessel, was successfully launched at South Chicago on May 31. The "Kearsarge" will be employed in the trade between Duluth and Buffalo and will be ready for service July 1. She is built on what is known as the channel type of construction and will carry two pole spars. It is thought that her capacity will be 3000 tons of freight. She is built with gangways and will carry package freight as well as grain and flour. She is owned by the Interlake Steamship Company. Briefly, the dimensions are: Length on keel 328 feet, beam 45 feet and depth 27 feet. The draft of water can be as deep as 20 feet when the new 20-foot channel through the lakes is completed. The engines are

### Auxiliary Coast Defense.

NEWHAVEN, ENGLAND, May 19.

A large number of invited guests came here to-day from various parts of the Kingdom for the purpose of witnessing a series of experiments with an armored train which has recently been constructed as an important feature of the coast defenses. That these armored cars are bound to play a very important part in actions carried on along the line of railway there cannot be a doubt. The fact that they are well recognized as being a very necessary addition is well borne out in our own country, as among the very first steps taken on the Isthmus of Panama a few years ago was the construction of an armored car that was to carry machine guns along the line of the railway between Colon and Panama. This car was to have been pushed along in front of the locomotive, and so well perfected were the arrangements, even in the very limited time allowed, that no doubt excellent and efficient service would have been rendered.

The armored train here experimented with was of particular interest, as it is the first of the kind ever used in this country. For military experts the trial was of more than usual significance, since it marks so important a departure in gunnery and the handling of artillery to the best advantage along a line of railway.

The train consists of a truck for the gun and two vans for the accommodation of troops and conveyance of ammunition. The truck is walled round with armor plates  $\frac{5}{8}$  inch and  $\frac{1}{2}$  inch in thickness. Upon the body of the truck is mounted a 40-pounder breech loading Armstrong gun, about 18 inches of the muzzle of which projects through a port hole in the armor plate. The weapon is placed upon a turn table, which can be easily revolved; indeed, it is said that the muzzle of the gun can be directed to any part of the circumfer-

\* Abstract of paper presented by Prof. Wm. H. Bristol of Stevens Institute, at the Montreal meeting of the American Society of Mechanical Engineers.

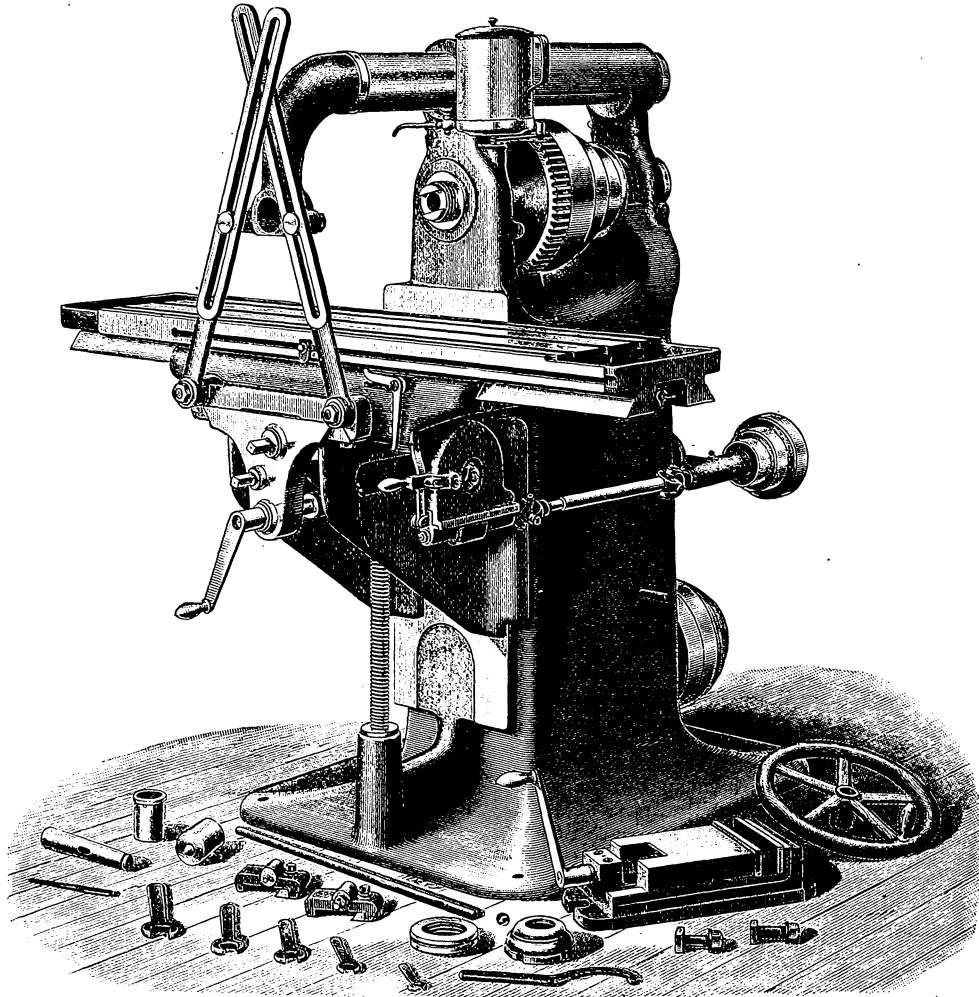
ence by handspike traversing in half a minute. The handspikes are worked at the rear of the gun by manual labor, but the gun may be traversed by a wheel and tackle inside the armor plating. The safety of the gun and the detachment working it when in action and on the permanent way are insured by the weight of the truck; the dimensions and construction of the turn table, by causing the wheels to run back on slides or metal grooves, gradually rising to diminish the recoil, by a prolongation of cross girders from underneath, supported by blocks when firing broadside, and by a powerful hydraulic recoil cylinder.

About a dozen rounds of shell were fired at targets placed in the water at

### The Brown & Sharpe Plain Milling Machine.

As this is one of a series of machines built by the Brown & Sharpe Mfg. Company of Providence, R. I., the following description is applicable in general (except as far as dimensions are concerned) to the larger and smaller plain milling machines. In the universal milling machines the table is fed at an angle to the axis of the spindle and there is provision for automatically cutting spirals. The plain machines are the more simple and consequently comparatively low priced, and as the table is not swiveled it can rest directly upon the knee or other support, and the ma-

gears are inside the column. The overhanging arm has a hole for a center, or for a bearing for the outer end of the arbor, &c. It can be easily reversed to receive an attachment, turned out of the way or removed. The distance from the center of the spindle to the arm is 7 inches; greatest distance from end of spindle to center in arm,  $26\frac{1}{2}$  inches. An arm brace is furnished, and with this in position milling can be done to  $18\frac{1}{2}$  inches from face of column. The table, including oil pans and channels, is 60 inches long, 14 inches wide and has a working surface  $48 \times 14$  inches. It has also three T slots  $\frac{1}{2}$  inch wide, a transverse movement of  $8\frac{1}{2}$  inches and can be lowered 22 inches from center of spindle. The feed of the



THE BROWN & SHARPE PLAIN MILLING MACHINE.

over a mile distant and which might well be considered as representing small craft about to make a dash for the beach commanded by the armored train. The firing was so accurate and everything worked so well that the experts present considered the experiment as thoroughly satisfactory. The gun truck was not at all effected by the recoil, remaining at all times perfectly steady, while the gun was manipulated with ease and rapidity.

The national convention of the National Association of Iron and Steel Workers will be held in Youngstown, Ohio, on August 4. It is claimed that by reason of the organization of quite a number of new lodges during the past year, the convention will be much larger than the last one held in Youngstown. It is further stated that a lodge of the finishers has been organized at Muncie, Ind., with a membership of 50.

chine is stiffer and can take a heavier cut, or accomplish more work in a given time. This machine has just been placed upon the market and presents a number of new features, chiefly in connection with the feed. The straight bearings are scraped to surface plates; the cylindrical bearings are ground and fitted to standards; the feed and elevating screws are accurately cut, and the alignments are correct. The size of the machine renders it suitable for general shop use.

The spindle has a hole its entire length and runs in bronze boxes provided with means of compensation for wear. The front end is threaded and has a hole fitted for arbors with taper  $\frac{1}{4}$  inch per foot and 1.25 inches diameter at the small end. The cone has three steps, the largest 13 inches diameter, for  $3\frac{1}{2}$  inch belt and is back geared, giving, with two speeds of countershaft, 12 changes of speed. The

table, 42 inches, is automatic in either direction and there are 12 changes of feed varying from 0.005 to 0.23 inch to one revolution of the spindle. The adjustable dials are graduated to read to thousandths of an inch and indicate the transverse and vertical movements of table, and these dials may be adjusted without the aid of wrench or screw driver. The frame is hollow and fitted as a closet to hold the small parts that accompany the machine. On the left side there is a pan for holding small tools, &c., and on the front of this there is a rack for wrenches. The vise has jaws  $7\frac{1}{2}$  inches wide,  $1\frac{1}{2}$  inches deep and will open  $4\frac{1}{2}$  inches. The countershaft has two tight and loose pulleys 14 inches and 18 inches in diameter for 4-inch belts and should run about 200 and 155 revolutions per minute. The net weight of the machine is 3435 pounds and it occupies a floor space of  $102 \times 59$  inches.

## CORRESPONDENCE.

## Steel Manufacture in the South.

To the Editor: In the issues of April 26 and May 3 of *The Iron Age*, Mr. J. B. Nau contributed a paper comparing European basic practice with that possible with the raw materials of the Southern States. The impression given to any one not acquainted with the South is that suitable qualities of coal, ore, limestone, dolomite, for basic steel manufacture, are found in many localities in close proximity to each other, so that they can be brought together at a very small freight cost. If Mr. Nau had stated that these conditions apply to the Birmingham, Ala., district instead of the South generally, I could agree with him. The investigations I have made and the experience I obtained in the manufacture of basic steel in the South and in Chattanooga have led me to believe that if steel is going to be made there in large quantities, it will be in the Birmingham district. When operating at Chattanooga it was found necessary to bring suitable pig iron 100 miles or more from one direction, gas coal, limestone, ore, dolomite, at equally remote distances from other localities, so that when they were all collected the freight rates were quite a large item on the cost sheet.

There may be other undeveloped localities, as, for instance, the Knoxville deposit mentioned by Mr. Nau, but until such districts put themselves in evidence as being capable of manufacturing pig iron as cheaply as Birmingham, I do not think they can hardly be considered as prospective steel manufacturers in the near future. I notice in the analyses of the Knoxville ores (Table IV, 4 to 12) the manganese is not determined. These are mentioned as being more suitable for basic Bessemer purposes than Alabama ores; I presume, therefore, they contain a considerable and regular percentage of that valuable metal. I do not think it is as important for Alabama operators to compare their chances against European steel as it is for them to investigate how they stand against Pittsburgh in their home territory or in other districts common to both. I shall therefore refer to the latter part of the article, which gives the cost of Southern iron and describes how easily it is to convert this metal into steel by the basic Bessemer or duplex processes. In Table VIII it is shown that standard basic Bessemer pig iron can be made for \$6.31 per ton. This is based on the fact that ore is mined at a cost not exceeding 50 cents per ton on cars. It is not stated whether this ore is Birmingham Red Mountain ore, although we may presume it is, as a freight of only 15 cents per ton is allowed to bring it to the furnace. This ore is unsuitable for basic Bessemer metal as it contains very little manganese. I must say that I claim extreme partiality for this most valuable metal in basic pig iron. Its presence in the blast furnace makes it possible to obtain in the pig low silicon coupled with low sulphur, which in its absence could not be accomplished. It is equally valuable in the basic converter, as it saves waste of iron and increases the temperature of the bath. In order to get the best results it appears necessary to have 1.50 to 2 per cent. of manganese in the metal. This means the substitution of other ores to take the place of the Red Mountain. I am reliably informed by a gentleman of large experience and intimately con-

nected with the development of Birmingham's natural resources that such a change would probably mean an additional \$1 per ton in cost on the metal.

It is very probable that pig iron is made in Alabama at \$6.37 per ton, but as this is foundry metal it is not safe to say that a standard basic Bessemer pig can be made for the same money. I prefer to add the \$1 per ton, which would bring it to \$7.37 per ton.

In Table IX is given an approximate cost of converting. Omitting waste, we find that the total operating expenses are \$3.78 per ton. I do not believe such a result could be obtained in America unless wages in all branches were down to a European level. There are many items omitted, such as molds and stools, sleeves, nozzles, stoppers, laboratory, fire brick, gannister, &c. In the items enumerated the quantity of manganese—15 pounds per ton of ingots—is small for basic Bessemer, but the greatest discrepancy occurs in the cost of basic refractories, which are included in dolomite and tar, and are totaled up to cost 21 cents per ton of ingots. My experience in operating basic Bessemer plants is that I have never been able to use as little as 50 pounds of dolomite per ton of ingots. It would not be safe to estimate less than 100 pounds, although after years of practice this may be somewhat reduced. The amount of tar required would depend upon the kind of converter bottom. If it was a pin bottom, then not so large a quantity as if tuyeres were used and the bottom were repaired by thin basic slurry. Anyway, 1 gallon of tar per ton of ingots is not excessive.

My opinion is that with standard basic Bessemer metal, valued at \$7.25 per ton, running direct through a mixer, ingots could not be made for less than \$12.75 to \$13 per ton. If a mixer were not used, then I believe it would be necessary to remelt the iron in cupolas, so as to thoroughly mix and get a regular silicon contents. This would entail an additional cost of 75 cents per ton. If the use of a mixer is patented, then whatever royalty is demanded should be added. I notice a credit of 60 cents per ton of ingots is expected for the value of the basic slag. There is no doubt that basic slag in Europe is very valuable and a source of profit to the manufacturer, but it must be remembered that local conditions often reduce and otherwise change values. In this case phosphate rock is mined very extensively in the South. Very recently large deposits of this valuable fertilizer have been found in some of the counties of central Tennessee, which I am informed can be mined very cheaply.

I have made basic Bessemer steel in the South and have tried to sell the slag, containing 18 per cent.  $P_2O_5$ . A finely prepared sample was sent to a State chemist. His report was as follows:

Insoluble phosphoric acid (citrate insoluble).....	6.63
Total available phosphoric acid (water and citrate soluble).....	11.20
Total $P_2O_5$ .....	17.83

If in comparison with other fertilizers one-third of the  $P_2O_5$  is considered of a decreased value, then the slag receives a serious handicap. There is no doubt that all the  $P_2O_5$  becomes available. It is dissolved slower than other fertilizers, a point which I think is in its favor. At the same time, this fact of only having two-thirds of the  $P_2O_5$  considered available by the power in authority is a difficulty, to change which calls for some earnest missionary work.

We should have been pleased to have received a credit of 60 cents per ton or less of ingots for our basic Bessemer slag. There is a considerable quantity containing about 18 per cent.  $P_2O_5$  and 1000 or 2000 tons containing 10 to 12 per cent.  $P_2O_5$  in the South to-day. It could not be sold there for any such price, and probably its owners now would not object to an offer of 60 cents per ton for the slag, instead of a credit of 60 cents per ton of ingots, which it represents. Having tried to sell the slag, without success, I think, therefore, for the present a calculation of 60 cents per ton of ingots is purely nominal and would not be realized.

We come now to that part of the article which supposes the irons are too high in silicon for basic treatment without previous desiliconizing. There is no doubt that the iron made in Birmingham from the Red Mountain ores will require some process of partial purification before it can be treated to the best advantage in the basic open hearth furnace.

Mr. Nau proposes to desiliconize by means of a fixed side blowing converter attached to the blast furnace, and states that every cast can be run into this vessel, desiliconized to the required point by means of blast furnished from the blast furnace engine. As this pressure is low for the vessel, he suggests placing the tuyeres near the surface of the metal. After he has brought the silicon down to the required point and the manganese and carbon to an undesirable point, the metal is transferred to the basic converter for conversion into steel or cast into pigs to be remelted in a cupola. All this is to be accomplished without any special machinery which one sees installed in Bessemer shops to decrease labor, and he reaches the climax by making the statement that it is to be done with only 5 per cent. loss of metal and a total operating expenses of 10 cents per ton. This interesting statement, if correct, makes one think our Bessemer steel manufacturers and engineers are greatly mistaken in their present ideas of economic practice and plant installation. In acid Bessemer practice the desiliconizing period is responsible for one-half of the converter's expenses, even when using a lower silicon metal, so if Mr. Nau can accomplish this for 10 cents per ton, surely he could decarbonize for an additional 10 cents and so would be able to supply liquid decarbonized metal ready for final additions and to be poured into the ladle for a total of 20 cents per ton. When one considers that this amount covers wages, fuel for blast, tuyeres, bottoms and other refractories, &c., it shows a wonderful saving when compared with the present system of blowing, and the attention of Bessemer steel manufacturers should be called to this without delay.

In reviewing this statement one finds the process proposed for the silicous metal is the duplex Bessemer, only with a supposed cheaper acid vessel. This process is not new, has been tried in various works, and wherever it came under my notice failed. It was generally wrecked owing to the enormous waste incurred, due to the loss of heat entailed by transferring the metal from the acid to the basic converter and to the oxidation of manganese in the desiliconizing vessel. The carbon was also oxidized more or less, according to the variation of the silicon contents. It is not surprising that metal should work unsatisfactorily under these conditions. It is poured from a hot converter into a ladle, again exposed to the air and fur-

ther chilled by being poured into a comparatively cold basic converter containing a quantity of lime required for dephosphorizing purposes. The metal being deprived of carbon and manganese, both heat elements, blows cold, causing excessive projections from the converter, an operation whereby one can easily lose an extra 5 to 10 per cent. of metal. The loss of metal in the acid converter averaged 10 per cent. when desiliconizing. The proposition to desiliconize the metal, cast into pigs and remelt in the cupola is objectionable, as if the duplex basic Bessemer process cannot be run direct, then its only supposed charm is taken away.

My opinion is that the cost of desiliconizing by pneumatic means will be very different in actual results than what Mr. Nau contemplates. In the first place, he states 5 per cent. loss of metal is ample. Experience has taught me that 10 per cent. is a minimum, even when using the present type of tipping vessel, with bottom tuyeres, which is by far the most economical style of converter. I believe the suggestion of the fixed side blowing converter with tuyeres "near the surface of the metal" is one of the most serious mistakes of the paper. Mr. Nau may have had experience with the side blowing converter. If so, he probably may have noticed that immediately the metal comes in contact with the blast dense volumes of dark brown fume pour from its mouth. This loss of iron commences immediately with the start of the blow, and is due to the fact that the oxide of iron generated at the tuyeres has not the same chance of becoming reduced by its combination with the metalloids as it has if the tuyeres were placed in the bottom as usual. It is only reasonable to suppose that if the oxide of iron has a deeper column of metal to ascend it has a better opportunity of being reduced than if the tuyeres are higher up. If the tuyeres are placed near the surface of the metal, as suggested, then the loss of iron would be further increased and the time required for blowing extended. The extra loss of metal would not be the only additional expense, as the slag being charged with oxide of iron would attack the acid lining, making constant repairs necessary to tuyeres and lining. When making steel in the small 2 to 3 ton Clapp-Griffiths or Hatton converters we found the quantity of tuyeres and bricks required for repairs was quite a respectable item in the cost sheet.

Mr. Nau does not state the size of his vessel, but we may presume that it is larger than the usual type of fixed converter, as otherwise it would be decidedly unfortunate for the blast furnace, seeing that he proposes to rob that efficient plant of its blast without giving it any credit. If the vessel is of 5 tons capacity, then a furnace of 150 tons daily output would have to be tapped 30 times. As Mr. Nau proposes to shut blast off the furnace and use it to blow the metal, and as every blow would consume at least 10 to 12 minutes, it means the furnace would be shut down five or six hours every day. If the vessel were twice as large—and I do not believe any fixed vessel of this size could be made to work in a practical manner—the blast would be cut off about three hours daily. No fuel is charged for supplying the blast to the converter. I can hardly see why this should be. If the blast were not desiliconizing it would be doing work in the furnace, so if one department takes it another is robbed, and as it would

mean an increased cost to the pig metal, it is only fair that the converter should be charged with this expense.

If Mr. Nau wishes to blow 10 to 15 tons of metal at a time, I believe he would find it a distinct saving to install the usual tipping vessel, with the accompanying special blowing machinery, pumps and cranes required in a Bessemer works, as it would save waste of iron and would certainly be more economical to run than any small attachment to a blast furnace. He proposes to sacrifice metal in order to get rid of silicon; and as this loss of iron will turn out to be the heaviest individual item in his cost sheet, he should take care to install the most efficient type of plant.

I figure that it will cost at least \$2 per ton to desiliconize by means of the converter, as when one calculates 10 per cent. loss of metal, wages, fuel, refractories, repairs, share of general charges, this amount is soon made up. Mr. Nau figures 41 cents per ton for desiliconizing, adds this to the original price of pig, \$6.31, making the metal cost \$6.72 delivered to the basic converter. He puts the loss down at 18 per cent. in the basic converter, the same waste as if the iron were a standard basic Bessemer iron containing the usual percentage of manganese. I do not believe any advocate of the duplex process claims that a desiliconized metal containing no manganese, lower carbon than the original pig metal, will blow with as little loss in oxidation, projections from converter, skulls, as if the metal were a standard iron. Yet this is what is expected from Mr. Nau's ideas of practical operation and cost, as he only adds 50 cents per ton, which is the amount that is required for loss of iron on the increased value of the desiliconized metal. We are to presume that the output will be as large from the duplex basic Bessemer as if it were the straight process, whereas experience has proved it cannot come anywhere near it. It is a slow running process, consequently wages and all other expenses are increased. No correct estimate of cost can be figured until after a lengthy and unpleasant experience with the inevitable "experience account." My impression is, however, that ingots could not be made by the duplex basic Bessemer process from \$7.25 metal for less than \$15 to \$16 per ton.

Mr. Nau states further that if the basic open hearth furnace is used, the metal can be decarbonized as well as desiliconized in the converter. He does not say how far this is to be carried on. Perhaps he desires to practically eliminate it all. If so, he falls into the error of other experts, who claim that a phosphide of iron is as economical and easy to work in the basic furnace as if the metal contained a useful amount of carbon. In the basic Bessemer dephosphorization takes place in the after blow, after the carbon is eliminated, but in the basic open hearth furnace it is desirable to dephosphorize and decarbonize at the same time, if rapid and the best results are to be obtained.

When I was in the South I gave this question of desiliconizing some attention. I was told by gentlemen connected with one of the largest concerns that they desired to manufacture steel from the iron made from red mountain ores; they then did not wish to discard those ores for this purpose and get others more expensive, with a view of experimenting on a basic Bessemer iron.

The metal made from red mountain ores is only suitable for conversion into

steel by means of the basic open hearth. Owing to the absence of scrap in that vicinity it is necessary to partially purify the pig metal if satisfactory results are desired.

Basic open hearth slag contains 15 per cent. of iron. I demonstrated that if liquid waste basic slag is poured together with liquid iron silicon is immediately oxidized, together with some carbon and phosphorus. This process is very economical, owing to the fact that this liquid slag is of no value and is a waste product from the steel furnaces, and by the oxidation of the metalloids iron is recovered from the slag which is otherwise lost. Mr. Nau proposes to create oxide of iron from pig metal in order to desiliconize, a source of supply which I consider very expensive for this purpose. It is formed in excess, and so a large waste is the result. On the other hand, by my process the oxide of iron is obtained, ready for work, from an outside source, the oxide becoming reduced and taking the place of the expelled impurities. By this means no loss is incurred to the bath of metal.

There are two methods of applying the process, either in a vessel similar to the present type of tipping converter, without tuyeres, wherein the metal and slag can be mixed together, or, in order to be more independent, it can be done in a furnace. The process is very rapid, and the metal can be tapped in about five minutes. It can then be transferred to the basic furnace for conversion into steel or cast into flasks or chills in ingot shape and charged into the furnace in solid red hot condition by a suitably designed charging machine. I believe that it is preferable to charge the stock in solid red hot form rather than liquid. It melts rapidly and oxidizing conditions can be set up during the melt, whereas when working a charge composed of all liquid metal the boil is very heavy and of long duration, which causes excessive wear to the hearth. A 20 or 25 ton furnace could be very rapidly charged if the metal consisted of eight or ten ingots. It is an improvement on the present system of filling pig iron and scrap into boxes and dumping them into the furnace. The boxes are more or less of a nuisance and expense, and sometimes damage the brick work.

The Tennessee Coal & Iron Company desired me to make a test to prove the above theory. I took any grade of metal they wished to send, from silver gray, containing 4 to 5 per cent. silicon, down to gray forge. When desiliconizing silver gray I introduced 5 to 10 per cent. of fine oxide when the metal and slag were mixing together; as the oxide is reduced and enters the charge as metal, it is an advantage to use as much as possible. After running some weeks the officials appointed to investigate reported that the process accomplished what was claimed for it, and that was a very cheap method of preparing their metal for the basic furnace.

I believe the basic open hearth is the correct process for Birmingham irons. With a properly designed plant embracing all improvements and labor saving devices, steel will be made exceedingly cheap. For basic Bessemer to be a success would depend upon being able to make a suitable iron in large quantities at the same price the present metal costs, also to find a good market for the slag. I am very doubtful whether this can be done under present conditions.

I must say I think that the basic open hearth is the process in which we shall see large developments. It will supply

the necessities of many steel manufacturers more satisfactorily than the acid or basic Bessemer. There is no doubt that the quality of furnace metal is more reliable than Bessemer, and for many trades is more desirable. I consider, therefore, that in the course of time the furnace portion of Thomas & Gilchrist's great and invaluable invention will come to be regarded in this country in rank superior to the converter.

BENJAMIN TALBOT.

PENCOYD, PA., May 30, 1894.

#### Cost of Pig Iron in the Birmingham District.

To the Editor: The cost of pig iron in the Birmingham district has been frequently estimated, with widely varying results, the figures ranging between \$10 and \$5 a ton. The higher figures were advanced by "outsiders" from a skeptical point of view, while the estimates resulting in the lower and lowest costs were put forward by "insiders," principally for "boom" purposes.

Until very recently the higher figures were undoubtedly much nearer the truth than the lower; but within the past few years great strides have been made in advance. The plants have been remodeled, the power increased and the practice generally improved, resulting in increased output and a marked fuel economy, which, together with minor economies, have brought about such a reduction in the total running expenses that the real cost now approaches the lower figures more nearly than the higher.

It is not an easy matter to give a correct estimate of the cost of pig iron in the Birmingham district, or, for that matter, in the South anywhere. It all depends on how you figure it. There are so many important factors which may be brought in or left out, and to which arbitrary values may be given, that the estimated cost may be made to suit the purpose or caprice of the perpetrator.

If the capital invested is to be taken into consideration, as some claim it should, how are the stock and bonds to be figured? At par, at what their owners bought them in for, or at their present market value?

Then comes the question of royalty on the coal, ore and limestone used. A price has never been fixed in this district, nor has it been decided that there should be any charge at all, when the supply is practically, if not absolutely, inexhaustible. Being thus unsettled, what shall be done about it?

Again, are the ore and coal mines to be considered as separate departments and be allowed a profit? Or, all being owned and managed by the same corporations, as is practically the case in the Birmingham district, should the raw material be charged to the furnaces at cost, or if a profit is to be charged, how much?

The limestone quarries form an exception. They are not directly controlled by the furnace companies. Thus the flux is the only constituent the price of which is to some extent at least regulated by the open market. The profits on the raw material will therefore have to be left out or arbitrarily assigned. It would seem but fair that the pig iron should be charged market value for the raw material used. But that does not help us over the difficulty, for under the present condition of things there is no market for ore, even at the actual cost of raising it. And as the demand for coal has been much below the capacity

of the mines for the past year, every ton of coal consumed by the furnaces has helped to decrease the cost of that sold outside, so that the mines are really profiting by giving the coal to the furnaces at cost. And as the furnaces in the majority of cases are using slack coal only, leaving the lump and nut for the market, the cost of mining is not only reduced, but the price of the coal sold is enhanced by virtue of the furnace consumption. It is, therefore, a question whether, even if the coal miners are to stand on their own bottom, a profit should be charged on the coal consumed by the furnaces.

Then comes the question of profits on the stores and rent. It is a very large item. With the Tennessee Coal, Iron & Railroad Company, according to their official report for the past fiscal year, it amounted to nearly \$255,000, or over one-third of the entire gross profits.

Should not pig iron receive credit for the proportional part of these profits resulting from the running of the blast furnaces and coke ovens, in an estimate which shall give its cost correctly? These items are always taken into consideration when the question of running or shutting down on account of low prices is discussed. But how are you going to get at the average value per ton of pig iron of the above items for the district?

There are other items, such as repairs, renewals and improvements, which are very hard to arrive at correctly. As a rule they are very high in the Birmingham district on account of the very poor original "boom" construction.

From the above it will be seen that it is not an easy task to get at the correct cost of pig iron in the Southern iron districts. The estimated cost will vary according to how you figure it, and a difference of several dollars can be easily made without trying to misrepresent.

In view of the pending tariff legislation in regard to which the iron and coal operators of Alabama have taken the stand that free ore and free coal would be absolutely ruinous to these industries in the South, and in the face of a great strike, one who has the real welfare of the Birmingham iron district in view would be expected to be much biased toward the higher rather than the lower cost estimate, but as this would bring us into direct conflict with our positive conviction that the Birmingham district, by virtue of its natural advantages, can and finally will produce the cheapest pig iron in the world, we are logically forced to take the broader and, on the whole, more patriotic view that the clamoring for the maintenance of high protection on the part of the business community of the Birmingham district is a short sighted policy and a flat contradiction of all the favorable reports, to say nothing of the "boomerangs" that have been made to attract capital to the Birmingham district.

The extreme stand taken by the operators against the miners who volunteered a reduction of 10 per cent. will also not result in any advantage to the district. It will be a dear victory to whichever side wins, and damage can only result to the combatants and still greater loss to the community at large.

Fortunately the follies of labor and capital cannot disturb the natural resources, nor annihilate or even greatly retard the technical progress in developing these resources and shaping the raw materials into articles of use and comfort at a minimum of cost.

In endeavoring to get at the true cost of pig iron we shall ignore the watered stock and inflated bonds as well as the exorbitant profits of the commissary stores.

They are both financial miscreants and have, or at least should have, no room in honest business enterprises.

In estimating we shall confine ourselves strictly to the raw material located within the Birmingham district. In fact, there is nothing brought in except a limited amount of brown ore, which, if clean and rich, works to good advantage, but is not essential either to regular running nor to good iron. We shall consider only the red mountain ore, of which there is an unlimited supply.

This ore occurs in two principal varieties—viz., hard and soft. The hard ore ranges from 10 to 30 per cent. in carbonate of lime and from 8 to 16 per cent. in silica. The average metallic iron is not far from 38 per cent. The soft ore ranges from a trace to 5 per cent. in carbonate of lime and from 12 to 40 per cent. in silica. Ores above 20 per cent. in silica are not used in the furnaces except through ignorance or for special purposes. These very siliceous ores are very abundant and will become available if the Barton & McCormick concentrating process shall prove a practical success. The average iron in the soft ore used in the furnaces is from 48 to 50 per cent. A good mixture of these ores is half and half, which we shall take as a basis, because it is in accordance with the quantitative occurrence of the ores. These ores can, however, be mixed in any desirable proportion, and self fluxing mixtures can be and have been successfully and economically smelted. The half and half mixture will yield from 43 to 45 per cent. in the furnace, and will therefore require on an average 2.25 tons of ore per ton of pig iron.

The above mixture with coke from unwashed coal will require about 1200 pounds of lime or 1000 of dolomite, which is both a purer stone and a stronger flux. While the red mountain ores cannot be classed as very easy smelting, they are by no means refractory.

Well burned coke of unwashed coal from the Pratt seam varies from 12 to 16 per cent. in ash and from 1.75 to 2.25 in sulphur, averaging, say, 14 per cent. ash and 2 per cent. in sulphur. The Blue Creek coke is much lower in sulphur but about the same in ash. The average fuel consumption for the past year will not vary much from 3200 pounds per ton of iron.

While all the furnaces were running in the district the following market values prevailed:

Coke, \$2.25 per ton delivered.  
Ore, \$1.10 per ton delivered.  
Limestone, 75 cents per ton delivered.

Making the cost of the raw material per ton of pig iron as follows:

Coke, 1.6 tons at \$2.25 .....	\$3.60
Ore, 2.25 tons at \$1.10 .....	2.47
Flux, 0.60 ton at 75 cents.....	.45

Total cost of raw material.....\$6.52

The cost of a ton of pig iron would be:

Raw material .....	\$6.52
Labor .....	1.25
Salaries and office expense .....	.15
Supplies, &c.....	.40
Repairs and renewals.....	.50

Total cost of a ton of pig iron....\$8.82

This was cost to those furnaces who had to buy everything in the open market before the depression had begun

to exert its full influence. To-day, or at least just prior to the miners' strike, for cash money the raw material for a furnace could have been bought as follows:

Coke, per ton.....	\$1.75
Ore, per ton.....	.75
Limestone, per ton.....	.60

At which prices and with the reduction in labor and supplies the cost of iron would figure as follows:

Coke, 1.60 tons at \$1.75.....	\$2.80
Ore, 2.25 tons at 75 cents.....	1.69
Limestone, 0.60 ton at 60 cents.....	.56
Labor.....	1.05
Salaries and office expense.....	.12
Supplies, &c.....	.35
Repairs and renewals.....	.50

Total cost..... \$6.87

That there is no money in the raw material furnished at the above prices is quite evident; but to assume that they could not be furnished at such prices without loss would be premature.

The red mountain ore can be mined and loaded on cars at an actual average cost not to exceed 50 cents a ton of 2268 pounds. The average freight rate is 17 cents per ton, the highest rate being 20 cents. Thus to the companies working their own ore mines the ore costs not to exceed 70 cents per ton delivered at furnace.

The cost of mining the coal varies between 60 and 80 cents per ton on cars at the mines. The miners volunteered a reduction amounting to about 5 cents a ton, and the operators are insisting on at least 10 cents a ton reduction, which would bring the average cost of coal down to 60 cents a ton in case the operators succeed in carrying their point, and would have stood at 65 cents had the miners' proposition been accepted.

The miners committed the great folly of a breach of contract in coming out before the time of the scale in force had expired, and the operators deserve the loss which they are sustaining for insisting on a cut which they could not reasonably expect to be accepted without a prolonged and a bitter struggle. If the operators succeed in their efforts to displace the white miner by the negro, it is still very questionable whether any reduction in the real cost of mining will result, and if the miners are starved into temporary submission the probabilities are that it will be of very short duration. On the other hand, should the miners succeed a raise will most certainly be demanded with the slightest improvement in the market. Under these conditions we are not justified in basing the cost of pig iron on coal below 75 cents on cars at the mines.

For the coke ovens located at the mines 5 cents will cover the cost of putting the coal in the bins ready to be charged into the ovens, making the cost to the ovens 80 cents per ton. The average yield, after deducting the loss in breeze, &c., is about 58 per cent. It will therefore take 1.38 tons of coal for a ton of coke. The cost of coking and loading on cars varies between 20 and 30 cents (including 3 cents for supplies and repairs to ovens), averaging, say, 25 cents per ton. Coke manufactured at the mines will therefore cost:

1.72 tons coal at 80 cents.....	\$1.38
Labor for burning and loading.....	.22
Supplies and repairs to ovens.....	.03

Cost of coke at mines..... \$1.63

The freight on the coke burned at mines to furnace varies very much, but the average will not exceed 15 cents, making this coke cost, delivered at furnace, \$1.78.

The coal coked at the furnaces will cost delivered in the bins not over 95 cents. As the coke made at the furnace receives one handling less, there is less loss in breeze and the yield will go probably 1 per cent. higher, and as the coke is taken from the yard by the furnacemen, the coking will cost at least 2 cents less, making the coke manufactured at the furnaces cost as follows:

1.70 tons coal at 95 cents.....	\$1.61
Cost of coking, per ton.....	.28

Total cost..... \$1.84

Allowing that there is as much coke made at the furnaces as at the mines, the average cost of coke will be \$1.81 at furnace.

With well burned coke from unwashed but properly mined coal, the fuel consumption can easily be kept below 1.5 tons of coke per ton of iron of 2268 pounds. We therefore have:

Coke, 1.5 tons at \$1.81.....	\$2.71½
Ore, 2.25 tons at 70 cents.....	1.58½
Flux, 0.60 ton at 60 cents.....	.36
Labor.....	1.00
Salaries and office expense.....	.12
Supplies, &c.....	.35
Repairs and renewals.....	.50

Total cost..... \$6.63

The above cost is probably from 25 to 50 cents too high for the best located plants and that much too low for others less favorably located.

By washing the coal a coke can be produced which will vary between 9 and 12 per cent. in ash and 1.25 to 1.50 per cent. in sulphur; say, on an average, ash, 11 per cent.; sulphur, 1.30 per cent. This coke will cost, nominally, 10 per cent. more than the unwashed; but actually the mines will be benefited, because the furnaces will thereby be enabled to use the unsalable coal, which will proportionally enhance the value of the coal sold in the open market. But even charging the total cost of washing to the coke, the furnaces will be enabled to materially reduce the cost of iron by using the higher priced but superior fuel.

With washed coke of the above analysis, if well burned, the consumption of fuel should not exceed 1.25 tons per ton of iron. The output will be increased at least 20 per cent. and the quality of the iron will be better, and hence all expenses, except ore and flux, will be reduced in the same proportion. The cost of flux will also be reduced at least 10 per cent. on account of less ash, so that the effect of washed coke on the cost of pig iron will be as follows:

Coke, 1.25 tons at \$2.01.....	\$2.52
Ore, 2.25 tons at 70 cents.....	1.59
Flux, 0.50 ton at 60 cents.....	.30
Labor.....	.80
Salaries and office expenses.....	.10
Supplies, &c.....	.28
Repairs and renewals.....	.40

Total cost of iron made with washed coke..... \$5.99

The above figures are supposed to cover mere cost. Repairs and renewals, however, are amply provided for.

How much should be allowed for bad collections, interest and other business contingencies, as well as royalties on ore and coal and for profits to the several departments, will vary with the business methods of the several concerns, and has nothing to do with the cost of pig iron pure and simple. Nor do the above figures represent the lowest possible limit of cost. As long as a ton of iron is not made on a ton of coke there is still room for improvement in the furnace practice.

When the retort oven shall have supplanted the irrational, inefficient and

wasteful beehive oven another dollar at least can be deducted from the cost of pig iron as above calculated. When this is done the Birmingham district will produce the cheapest iron in the world. **Pig Iron.**

## THE WEEK.

Reports from the Northwestern States point to excellent crop prospects in nearly every district. The promise of a large yield was never better at this season of the year.

The official Treasury statement places the stock of gold, gold coin and gold certificates in the United States, on June 1, at \$665,000,000. Of this amount the national banks of New York State hold \$85,700,000, Illinois coming next with \$26,000,000 and Pennsylvania third with \$20,650,000.

The past season has been a hard one for lake marine insurance companies, owing to the unusually large number of vessels lost on the lakes. The companies are advancing their rates from 50 to 150 per cent.

The official statistics of imports and exports for the ten months of the fiscal year ending April 30, 1894, show a falling off of \$123,500,000 in imports into the United States, as compared with those of the corresponding period of last year. Exports, in the same time, increased over \$53,500,000. The figures given are as follows: Imports in 1893, \$354,213,427, and in 1894, \$230,719,588. Exports in 1893, \$701,036,375, and in 1894, \$754,606,522.

Because some imported Italian marble mantelpieces had been received for the new mansion of Elbridge T. Gerry in this city, all the workmen employed in the building, including plasterers, carpenters, plumbers, tile layers, electric wire men and iron workers, quit work on Monday, by order of the Building Trades Union. The unreasonable tyranny of organized labor was never more strikingly exemplified. More than \$10,000 have been already paid to American workmen employed on the building for interior decorations alone. The union puts its case on the ground of objection to "the use of the products of foreign labor," and the Gerry house has been selected as a test case.

May's fire losses in the United States, according to the lists published by the *Journal of Commerce*, reached a total of \$10,777,800, compared with \$11,540,000 in the previous month and \$10,427,100 in May, 1893.

Importations of foreign bituminous coal continue. During the week cargoes have been received at New York from Wales and Nova Scotia.

The latest addition to the American Line's transatlantic fleet is the "Kensington," which made a most successful trial trip on the Clyde last week. The vessel was built by J. & G. Thompson of Clydebank, Scotland, the builders of the "New York" and "Paris." She is 480 feet long, 57 feet beam and 40 feet deep, with gross tonnage of 10,500 tons, and a measured cargo capacity of 11,500 tons. The "Kensington" is fitted with quadruple expansion engines of 8000 horse-power, and is expected to attain a working speed of 15 knots per hour. While primarily a cargo and steamer ship she will have accommodations for 300 cabin passengers.

# The Iron Age

New York, Thursday, June 7, 1894.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.  
CHAS. KIRCHHOFF, - - EDITOR.  
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.  
JOHN S. KING, - - BUSINESS MANAGER.

## An Extraordinary Combination.

The partial recovery from recent frightfully low prices of iron and steel gives rise to much discussion as to its probable permanence. Decided differences of opinion prevail. On the one hand it is claimed that the advances made are due wholly to the scarcity of fuel, and that as soon as coal miners return to work a relapse will take place. On the other hand, it is argued that the manufacturers will not foolishly throw away all of the little advantage they have gained, but that they will manage to retain a part of it. They have had a serious lesson in the direful effects of reckless competition for orders, and may be expected to exercise a little more prudence in the future. This claim is put forth irrespective of a possible stiffening in the cost of production by an advance in miners' wages. The rejoinder is made that the real test of the strength of prices is the condition of the demand, and that unless it radically increases the iron market will be very weak after fuel becomes plentiful, with an inevitable drop to previous low prices. But to this assertion answer is made that the late depression in prices was abnormal, inasmuch as values in some cases were forced below the European level notwithstanding the higher wages still paid here. Low prices were to be expected, but by no means as low as have just been experienced. The claim is therefore advanced by those who hold to this view of the case that the depth of the depression has been passed and that so low a point may not be touched again for years.

Investigating the arguments which support this position, it is found that a most extraordinary combination of depressing influences have operated in conjunction in this country, unsettling business here more seriously than in any other country on the globe and perhaps disorganizing productive industry more than even civil war could accomplish. These several influences are worthy of detailed enumeration, as follows:

1. The aftermath of the Baring failure. This was the beginning of the blight which settled on our fairest hopes. From this time British capitalists began to realize on their American investments, turned from buyers to sellers of securities and drew steadily on our stock of gold.

2. The culmination of real estate booms and town building speculations. In ordinary times speculative enterprises like these can suffer col-

lapse and only affect a limited number of people in addition to those whose investments are lost. Coming at this time, however, they exerted a seriously disturbing influence, as they weakened many capitalists and financial institutions, so that they were unable to withstand subsequent shocks to their credit.

3. The completion of the enormous iron and steel producing plants. Never before in the history of the American iron trade were so many very large and finely equipped works built as in the five years from 1889 to 1894. Labor saving machinery of the most ingenious character, bringing into play the latest applications of electricity to mechanical devices and enormously increasing the output of a fixed plant, has been introduced without regard to expense. These improvements have been duly chronicled from time to time in our columns, and their probable effect on prices has been discussed. In themselves they would undoubtedly have caused a lowering of market rates on their products. The multiplication of billet mills during the same period has also worked a revolution in this line. In the same connection the fact must not be overlooked that blast furnace and rolling mill practice are steadily advancing in every section, increasing the output of a given plant and, of course, reducing the cost of production.

4. An apparent superabundance of crops all over the world. While it is a disputed point as to whether the food crops of the world have been excessive in recent years, no doubt exists whatever that the supply has been far in excess of the immediate demand at any time and at any point, so that prices of farm products in America have been forced to a much lower point than ever before, and far lower than agriculturists have figured as the actual cost of production.

Cotton has proved no more profitable than wheat. As to wool, exports are being made of a considerable portion of the domestic clip, showing that prices here are at least as low as those abroad, which is an anomalous condition in the American wool trade, because this country was never before able to supply the wants of its wool manufacturers. Under these circumstances farmers and planters are driven to the practice of the most rigid economy, greatly curtailing the demand for tools, implements, hardware and general manufactured products.

5. The opening up of a new iron ore field. At what seems to have been the most inauspicious time in our industrial history, a new iron ore field is discovered, with immense deposits of high grade Bessemer ore, in an accessible location and above all capable of being mined at lower cost than any other known deposits. The Mesaba range introduced an element which upset all calculations, disturbed all values of iron and steel, and whose force in reconstructing cost sheets has not yet been satisfactorily measured. Other

discoveries of iron ore in the Lake Superior region were timely, as additional supplies of steel ores were then needed, and in a short time would have been badly needed. The opening up of the Mesaba, however, is in some respects almost a calamity at present, although a year or two hence it may be regarded very differently.

6. The destruction of capital invested in railroads. This has been a most serious feature of the business situation, brought about partly by maladministration of railroad officials, partly by ill advised legislation in various States and partly by the construction of too many competing lines. Railroad securities have consequently come to be regarded as hazardous risks by investors and financial agencies, and the industries dependent on railroad patronage feel the consequences of this withdrawal of the public confidence.

7. The decline in the value of silver. The fall in silver, which so greatly widened the difference in value between silver and gold, was so rapid as to bring about a crisis in commercial affairs which would probably have been very severe even if unattended by other baleful influences. The possibility that the United States would permit its currency to be established on a silver basis aggravated the distrust of American securities felt abroad and accelerated the process of liquidation, resulting in an increased outward flow of gold.

8. Tariff legislation. In the midst of this wreck of values, rearrangement of industries, disorganization of finances and chaos generally comes a bar to rapid recovery in the form of tariff legislation. The importer then ceases to order shipments for the future, so that he may take immediate advantage of any reduction in duties and suffer no loss on stocks imported. The merchant is in no haste to replace goods on his shelves or in his warehouses, but will wait to see how prices may be affected. The manufacturer runs only on orders and lays up no stock because he will take no chances on heavy losses through reductions in price. Projectors of improvements defer initiatory steps until they also can "see what Congress is going to do." Trade languishes, and energetic business men vainly resist the paralysis which they feel creeping over them with the long delay.

This is a formidable array of the chief influences which have borne down prices of iron and steel, as well as other manufactured goods. Some of them are of sufficient importance to have depressed the national market with their own unassisted weight. Taken together they form a combination so powerful in depressing prices that it can well be seen why values here have in some cases dropped below the European level. Now that the point of conjunction of all these forces is past, that some of them have spent their force and the market has slightly recovered, it seems entirely rea-

sonable to believe that a complete relapse to the very low prices of the first quarter of the year will not take place.

### Shop Nomenclature.

Every trade is prone to develop a distinct dialect or set of technical terms and phrases—as a rule, most appropriate to its character but likewise almost unintelligible to the outsider. The machinist can talk a language that is no clearer to the uninitiated than that of the abstruse scientist, except, perhaps, because of a certain symbolic meaning to be found in many of the technical terms. In fact, one cannot fail to be impressed with this spirit of symbolism as he hears the familiar names of parts of the human body applied to inanimate tools and machines.

The character and use of the lower portion of a machine is vividly presented to the mind when it is called a leg or a foot: the terms "body," "head" and "back," mechanically applied, are immediately clear to us, while there appears at once a fitness in the "arms" of a pulley, the "hands" of a watch or the "fingers" of a clutch. "Eyes" and "ears" are certainly suggestive terms when they refer to objects with which the machinist has to do, and so we find both similarity of form and use existing between the human jaw and teeth and the "jaw" of a vise or the "teeth" of a saw.

Seemingly, having exhausted the body as a source, the versatile mechanic has turned to the clothing we wear. He can show one either a "shoe" or a "cap;" will place a "button" where it will do its duty as a knob or will hold two pieces together; he will even fit a "collar" or a "sleeve" over a shaft.

All this in the way of curious terms and striking resemblances, but there is withal an important side to this matter of technology, or rather technical dialect. As it is well to-day that all men of science and letters can communicate through one language, the Latin (although it be dead to the world at large), so it is desirable that, at least within the limits of our own English tongue, there should be agreement among technologists, professors and artisans as regards technical terms and their definitions.

For this dialect changes with the locality. Words that are familiar to us upon this side of the Atlantic are simply unintelligible to the English mechanic, and perhaps even more generally the reverse is the case. Thus the pitman of the Englishman or of our own old millwrights becomes the connecting rod of to-day and of this country. The punching bear is almost unknown to us by name, but the term screw punch is at once suggestive and explanatory of a common tool. The tap bolt of one locality is the capscrew of another, and so on.

Mechanical and technical dictionaries of course serve to clear up some of the difficulties, but nothing is truer

than that the lexicographer records but does not originate the terms or their definitions. In many a shop the origin of certain accepted titles can be traced back to the facetiousness of some workman who in the spirit of humorous comparison gave a symbolic name with such fitness that moral suasion could not overcome it. In fact, things must have a name, and if not well christened they are sure to be badly nicknamed.

Indeed, it is common to find an article known by one name in the office and drafting room and by another entirely different in the shop. Thus the simple and explanatory title "bed" (of an engine) was found in one case to have been turned into "bullhead" by the molders, notwithstanding that there appeared neither symbolic nor sentimental reason therefor.

The draftsman is often much troubled by this action on the part of the workmen. He gives his drawing a certain title or makes an itemized list of the parts, giving to each a name, but finds subsequently that his terms and titles when expressed in shop orders are not perfectly intelligible. His titles are likely to be long, but intentionally comprehensive, nevertheless his "regenerator spring rod clamp" is likely to be christened by the workman with a name perhaps less explanatory, but assuredly simpler and shorter.

In this matter there should certainly exist the spirit of co-operation. There is no use in trying to make a bird sing that won't sing, and therefore there should be such agreement upon terms and titles that no misunderstanding can possibly arise.

### PERSONAL.

J. R. Morgan, who has acted as superintendent of the Knoxville Iron Works, Knoxville, Tenn., has resigned and has returned to Allentown, Pa.

W. J. Isaacson of Cincinnati, managing director of the Dayton Coal & Iron Company of Dayton, Tenn., has sailed for England on the "Paris."

W. H. Jaques has retired from the Bethlehem Iron Company, South Bethlehem, to become associated with Horace See, the well-known engineer and naval architect, to engage in general engineering work and consultation in connection with the manufacture and treatment of guns, armor, shafting and other war material, the machinery required for their production, and especially with the fluid compression and hydraulic forging of steel and the best types of armor. The office of the new firm will be at 1 Broadway, New York.

H. L. Gantt of 316 Walnut street, Philadelphia, Pa., who is well known in connection with his work in the manufacture of steel castings, has embarked in a new venture. He is making a specialty of furnishing specifications for and undertaking the inspection of steel castings.

Four new steamships of 4000 tons each have been ordered by the North German Lloyd Steamship Company. Two of them will be built by the Vulcan Company of Bremen and two by the German Shipbuilding Company of Kiel.

## Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., June 5, 1894

Commodore Sampson, who had charge of the Department investigation of the charges of irregularities in the manufacture of armor plate by Carnegie, Phipps & Co., said to-day that it was not probable that he would make a report on the investigations conducted by himself, Professor Alger and Lieutenant Ackerman. The reason for this, he said, was that the House Committee on Naval Affairs had taken up the question and would now prosecute the subject on their own lines and more comprehensively than covered by Department instructions.

In view of this all the testimony and papers accumulated by the Sampson Board have been turned over to the Naval Committee. This in itself indicates that their labors have terminated. The Commodore and his associates have also given the committee the benefit of their views, based upon expert knowledge, experience and inquiry.

The most important testimony was that showing the practicability of specially hardening certain parts subjected to test and stinting others. The method of checking off data concerning the stages of the plate in progress of manufacture was also shown to be in some cases of rather a perfunctory character on the presumption of the honesty and responsibility of the men in immediate charge. The passing over of blow holes and other evidences of negligence, if not intentional, yet having the same result, was also specially noted.

The latest batch of information from informers is not likely to materialize any visible pecuniary reward as the investigation of the parties concerned developed nothing new, or rather which had not already been covered in the first exposure. Besides, any reward for information would now have to come from Congress by appropriation, which is a long winded and uncertain process.

The fact of irregular methods practiced in the manufacture of these plates has already been sustained, but whether with criminal intent to defraud the Government will be for the committee and Congress to conclude. The tone of conversation indicates that if the subordinate "bosses" were making poor armor in order to deceive the Government and impose upon it, in defiance of the liberal contract prices paid, an inferior article, the entire contract with the Carnegie Company will be canceled and other steps will be taken by the Government to secure redress from the concern.

The armor plate industry is just now in a somewhat mixed condition. The Carnegie plant is under a cloud and will remain so until the present unpleasant investigation is determined one way or the other, and the 18-inch Bethlehem plate was knocked out in the first round. In regard to the trial of a second plate, it was said at the Ordnance Office to-day that it might be two weeks or a month before the next plate would be ready. A great deal hinges on this trial. If the Carnegie contract should be canceled it would throw all of this work on the Bethlehem Company. It is a question, however, in the event of the existing armor contract with the Carnegie Company being cancelled and new bids were

asked, whether they could not again secure the contract if their figures were the most favorable. The Department would have the discretion in the matter of selection, as the lowest bid must also be attended with all the conditions to a full and faithful performance of the terms of the contract.

This Carnegie agitation has given rise to some comment and discussion in the Department among experts on steel as to whether the hardening of iron converted into steel is a patentable process. The discussion also went to the extent of asking whether the Patent Office is pursuing the correct policy on this subject. One of the officers high up in authority said: "The cementation process is an ancient method of converting iron into steel, and I have always been surprised that patents have been granted for the process beyond the simple mechanical appliances for the application of new methods of treatment. We can remember how in the old days a country blacksmith would make his own case hardening steel by taking the iron, incasing it in the parings of horses' hoofs, and rolling it up in clay; then he would put it in his forge fire for a few hours and then souse it in cold water, 'and it was done.'

"Now they apply the same principle on a large scale with charcoal or bones or any other form of animal carbon. I can only see that the system of spraying is different from the old process, but even then it does not seem that to throw jets of cold water against a hot mass of iron is a patentable performance."

It appears that there are several new processes hinted at by parties in communication with the Department or informally with individuals, but the bugbear of law suits for infringement stands in the way of bringing them out. As the Government wishes the best they are encouraged to go ahead. This, they claim, would be the only way to test the rights of some of the sweeping patents.

Special processes under the head of discoveries or invention of new methods of applying certain forces or agents is admitted to be securable by law to a certain extent, but any one improving on the application of a similar law of mechanical application is claimed to have an open right to his discovery if it does not imitate something already in use.

The official report on the engine trial of the "Columbia" shows excellent results. With six boilers and three screws, 105 pounds pressure, 92 revolutions, at a speed of 16.41 knots, 6879 horse-power was developed. One screw, 128 pounds steam, 73.7 revolutions, 10.06 knots, 1751 horse-power. Three screws, 133 pounds steam, 106 revolutions, 18.4 knots, 9757 horse-power. The actual extent of the damage will be ascertained by docking. Until then the Department will have nothing to say.

#### The Tariff.

The disposition of the tariff question in the Senate continues to operate on the double back acting principle. The tenth week has now been begun, and the prospects of any sort of a bill receiving concurrent action are more remote than at any time during this most extraordinary controversy. The extreme so-called tariff reformers of the House are conferring and conniving against concurrence in the schedules which have been raised to a revenue and partially protective basis in the Senate. This is specially so as against the metal

schedule. This portion of the bill it is claimed will be antagonized completely by non-concurrence and insistence upon the House ad valorem rates. Whether party discipline can be made efficacious in sustaining the Senate's action in view of expediency remains to be seen.

It becomes more and more doubtful every day as to the practicability of securing the passage of any kind of a bill. The effort to placate opposition in certain quarters in order to secure votes has already proven a source of weakness rather than strength. The complications on the sugar schedule are also likely to cause ultimate delay. The House is in no temper to concur in the Senate scheme.

The conversations of Senators like Allison and Aldrich do not indicate the passage of a tariff bill according to the present outlook, and instead of the situation improving it appears to be taking an opposite turn every day. The best judgment of men here is that industries manufacturing for the fall and winter trade could safely go ahead to supply demands for that market on wages within the limit of safe production on a scale of protection against foreign goods on the line laid down by the Senate amendments. No bill is likely to pass with rates lower than that.

#### Duluth News.

Iron ore shipments are large from all the ports on Lake Superior, and for the season to date have been 366,000 tons from Duluth and Two Harbors up to last Saturday, 335,000 from Ashland, and nearly as much from Marquette. Two Harbors and Ashland are each over 100,000 tons in excess of their shipments to this date last year, while Duluth has shipped more than to August last season. The Chandler Mine on the Vermillion range has sent out 103,000 tons, leading all the mines of the district. The Minnesota Iron Company's Canton Mine is the leader of the Mesaba.

Were it not for the general opinion here that the coal strike would soon end, the outlook for shipping would be very blue. While there are on docks at the head of Lake Superior not less than 250,000 tons of soft coal, and at Ashland about 125,000 tons additional, no fuel company at either place is in position to sell as large a lot as 2500 tons. Every possible economy is being practiced by the roads and mines to help out the supply of coal, and the roads are even accused of delaying shipments to regular customers so that they may have a supply at the head of the lakes that they may confiscate later, if necessary. If the strike ends soon there will be a tremendous traffic in coal for the remainder of the season, and the tonnage engaged in the trade will have plenty to do and at better rates than have ordinarily prevailed.

Sales of ore additional to those heretofore reported have been made, chiefly from the Mesaba, by mines both in and out of the Rockefeller combination. A little Vermillion range ore has also been sold and that range is about sold up for its season's output.

On the arrival of the first petroleum tank steamer at Shanghai recently the Chinese customs officials refused to permit the landing of the oil in bulk. It required the joint powers of the British, German and Russian Consuls to persuade the officials to reverse their decision.

#### San Francisco News.

The large imports of hardware, iron, steel pipe, machinery, &c., by rail for the past three weeks constitute a notable feature of the trade. They have not been called for by the present condition of business, and can only be accounted for by the desire to lay in supplies before advanced rates should take effect. For the three weeks they embraced 180 carloads. Of these 60 cars were laden with merchant iron, bar and bundle; 55 carried loads of iron pipe, and there were 11 cars of machinery and large quantities of other lines of merchandise of this description, so that whatever may happen in the way of freight rates our hardware merchants are pretty well supplied. There is every facility for the transaction of a great trade this fall if the trade would but come, but the signs are not as favorable as could be hoped for. In this respect I wish to correct a misapprehension into which Miller, Sloss & Scott, the active successors to the old and renowned firm of Huntington, Hopkins & Co., have fallen. I did not state that San Francisco had lost her chance to trade north or south, or to extend the field in which she could compete. I merely drew attention to the fact that the railroad had advanced its west bound rates on all merchandise, to take effect after a certain time. I also pointed out that this was not in the direction of extending San Francisco's chances for trade, but rather of restricting them, but pointed out that the competition between the Panama Railroad and the Southern Pacific would, though allowing San Francisco still to compete, bring her uncomfortably close to the line of danger and that it did not increase her chances by any means. As to the actual rates at any particular moment of time they depend much on the conditions of the war of tariffs between the railroad on the one hand and the steamship company on the other. Certainly the conditions of the trade as far as San Francisco merchants are concerned have not improved—quite the contrary. I wish I could say that they had improved, not that I wish to advance the interests of San Francisco as against those of the rest of the coast, but that I believe the interests of San Francisco rightly understood are those of the other leading cities of the coast also. At present there is no rapprochement between the Southern Pacific and the Panama Railroad, but there are rumors in the air that such an event is close at hand, and I should not be surprised if it were. I have all along wondered why the astute manager of the Southern Pacific took things so easy, and thought that some day or another the public of San Francisco would wake up to find that Mr. Huntington had bought up the controlling interest in the Panama Railroad, or had buried the hatchet, and that the steamers of the Pacific Mail had resumed their trips with the old time regularity. And though our merchants hope that such an event will not take place I confess that I am looking for it every day.

Trade for the past two weeks has been a little more active than for some time preceding, especially in agricultural implements, where the prospect has improved materially since the late rains. In hardware and iron and steel there has been a fair demand, but not as good as for the same time in 1893. With wheat at 85 cents to 87½ cents, nearly 50 cents lower than we are wont to consider the normal figure, there is

very little encouragement for the majority of our farmers to make improvements of any kind or purchases as things are at present. Our orchardists, however, will have a very fair year and considerable business will come from them. The spring trade has been light and from now on to the opening of the fall it will be light also. Should there be any improvement in the price of wheat there will be a very good fall trade, but it must be confessed that the outlook is not promising.

There is no change in the condition of the market. In pig iron, pig tin or tin plate, the market is without any material change and is on the whole quite dull in all these lines. The nail market is very firm; the base price for iron and steel is \$1.75 per keg.

### Pittsburgh Freight Rates.

Taking effect Friday, June 15, 1894, freight rates from Pittsburgh and points taking Pittsburgh rates to points west of Pittsburgh will be advanced as follows:

From Pittsburgh and points taking Pittsburgh rates to—	Group 1. Per ton.	Group 2. Per ton.
Akron, Ohio.....	\$1.15	\$1.15
Anderson, Ind.....	2.00	2.30
Chicago, Ill.....	2.40	2.75
Cincinnati, Ohio.....	1.80	2.00
Cleveland, Ohio.....	1.15	1.15
Columbus, Ohio.....	1.70	1.80
Dayton, Ohio.....	1.80	2.00
East St. Louis, Ill.....	2.75	3.15
Evansville, Ind.....	2.75	3.00
Indianapolis, Ind.....	2.00	2.30
Jamestown, N. Y.....	1.40	1.40
Lima, Ohio.....	1.75	1.75
Louisville, Ky.....	2.60	2.90
Muncie, Ind.....	2.00	2.30
Oil City, Pa.....	1.25	1.25
Olean, N. Y.....	1.40	1.40
Richmond, Ind.....	2.00	2.30
Rock Island, Ill.....	2.75	3.15
Salamanca, N. Y.....	1.40	1.40
Springfield, Ohio.....	1.80	2.00
Terre Haute, Ind.....	2.40	2.75
Zanesville, Ohio.....	1.55	1.55

To points east of Pittsburgh rates will be advanced on the above date as follows:

From Pittsburgh and points taking Pittsburgh rates to—	Group 1. Per ton.	Group 2. Per ton.
Passaic, N. J.....	\$2.40	\$2.70
Paterson, N. J.....	2.40	2.70
Binghamton, N. Y.....	2.00	2.30
Carbondale, Pa.....	2.00	2.30
Elmira, N. Y.....	2.00	2.30
Hornellsville, N. Y.....	1.80	2.00
Wallsville, N. Y.....	1.80	2.00
Harrisburg, Pa.....	1.80	2.10
Philadelphia, Pa.....	2.00	2.30
New York City, N. Y.....	2.40	2.70
Boston, Mass.....	2.80	3.10
Albany, N. Y.....	2.25	2.70
Utica, N. Y.....	2.20	2.60
Baltimore, Md.....	1.80	2.10
Syracuse, N. Y.....	2.00	2.20
Buffalo, N. Y.....	1.40	1.40
Rochester, N. Y.....	1.80	2.00

Rates shown under head of Group 1 will apply on pig iron, mill cinder and scale, per gross ton, in carloads of 12 gross tons and over.

Rates shown under head of Group 2 will apply on billets (iron or steel), blooms (iron or steel), borings (iron or steel), chain iron (in coils), crop ends (iron or steel), ingots (iron or steel), muck or puddle bars, old car wheel, and axles, old rails, scrap iron, scrap steel, scrap tin, slabs, unfinished (iron or steel), and wire rods (in coils), per gross ton, and on cast iron pipe and ingot molds per net ton, in carloads of 12 tons, net or gross, and over.

The rates on billets, blooms and slabs will apply only on such unfinished material as is intended to be rerolled, and can be transported in open cars without damage from exposure to weather, and which are covered by the following description:

Billets and blooms, the combined measurements of the width of the four sides of each being not less than 14 inches; also billets of less sizes than

the above named, provided they are square (not round, flat or oval), the weight of each being not less than 150 pounds.

Slabs, rough and unfinished, the combined measurement of the width of the four sides of each being not less than 14 inches, and each slab to be not less than 1½ inches in thickness.

### The Cornwall Purchase of the Lackawanna Company.

One of the most important transactions in years in the Eastern steel industry was consummated last week at Lebanon, Pa., after protracted negotiations. Walter Scranton, president of the Lackawanna Iron & Steel Company of Scranton, Pa., purchased the interests of Robert H. Coleman in the Cornwall ore banks from the assignee, H. T. Kendall, and the Pennsylvania Company, for Insurance on Lives and Granting Annuities. The Lackawanna Company take possession of the property to-day. The purchase includes 15½ shares out of the 96 shares of the ore mills at \$135,000 per share, or \$2,109,375, the two Colebrook furnaces, including 96 acres of land and dwellings, at \$300,000; the two Cornwall anthracite furnaces, with tenements and 450 acres of valuable land, at \$100,000, and 6906 shares of the Cornwall & Lebanon Railroad at \$31.75 per share, making \$219,265 50. This makes the total purchase \$2,509,375. The real estate conveyed as subject to mortgage is one for \$1,500,000, one for \$500,000, one for \$150,000, one for \$62,500; total, \$2,212,500. The company assume all mortgages, payment of principal and interest.

The Cornwall ore property is known as the greatest ore deposit in the United States and is not rivaled by any worked deposit in the world. The ore is a Bessemer ore very low in phosphorus, but carrying about 2.5 per cent of sulphur and 0.45 per cent. of copper, so that it must be roasted. It is mined in open trenches from the hill side at a cost lower than that of any other deposit in this country, the famous Mesaba steam shovel mines not excluded. The product was 663,755 tons in 1891 and 634,714 tons in 1892. Pig iron, in spite of the necessity of roasting the ore, is made very cheaply, a current estimate in the Eastern iron trade being about \$8 per ton. The Cornwall ore property has always been in the possession of the descendants of the first owners and this is the first time that parties not connected with the family have acquired an interest.

The two Cornwall furnaces, which produce about 6000 tons monthly, were in their day the "swellest" furnace plant in this country, all the buildings and appointments being of the best. The Cornwall anthracite furnaces are old and small.

The Cornwall & Lebanon Road has rivaled the Pennsylvania in character of road bed, stations and equipment.

The acquisition of the Coleman interest by the Lackawanna Company places them in an admirable position so far as the control of the Eastern steel rail trade is concerned. The use of Cornwall pig in heavy percentages in the manufacture of steel rails was first developed by W. W. Scranton of the Scranton Steel Company. Before that time the high percentage of copper in the pig was considered an insuperable objection to its employment, except in small quantities in mixture with standard Bessemer irons.

### New Publications.

USES OF COMPRESSED AIR. By Addison C. Rand. 134 pages, 94 illustrations. Price, \$1. The Republic Press, New York.

This book, while not intended to be a scientific exposition, is issued to present a comprehensive account of the important uses which have been found for compressed air, within a very short period, and the utility of air as a motive power. In carrying out this plan the author has described the principal uses of compressed air in plain language and has briefly explained many possible uses. It is stated that the most important application of compressed air in the past has been to rock drills in tunnels and mines, and in both these fields the drill has accomplished wonders within a decade. The wonderfully rapid work done at Hoosac Tunnel, the New York Aqueduct and the Niagara Falls Tunnel is commented upon.

Naturally, the first portion of the work describes the air compressor, those now in general use all over the world being fitted for surface cooling and the delivery of dry air. This method practically eliminates the physical difficulty of extremely high temperature of air attendant upon compression, which up to recent years made the practical economical application of compressed air almost impossible. The modern compressor is generally of the horizontal duplex type of steam engine, but its action is, of course, directly the reverse of the latter. When very high pressures are needed the compression is done in three or four stages by air cylinders in suitable number and proportions. Next follow accounts of notable drilling in rock, the work at Niagara Falls being the latest and one of the most important in which the drill has played the conspicuous part. Descriptions are given of work in caissons, open cuts, particularly the Chicago drainage canal. Another application of compressed air is found in tapping iron furnaces by means of a compressed air drill. In old fashioned furnaces of small capacity the operations of opening and closing the tapping holes were of small moment, but at the present time, when the hole is stopped with from three to five wheelbarrow loads of clay and graphite instead of one ball, the opening requires the labor of several men for a long time. Recently the compressed air drill has been used for this purpose with the greatest success. This method is not only labor saving, but it has been found that as the drill cuts a true circle, the hot iron and cinders are not so destructive. The construction and operation of the air brake and the compressed air safety appliances on railroads are illustrated and fully described. We find compressed air employed for lifting and carrying loads; for cleaning steam passages and parts of new locomotives, or old ones that have been repaired; forcing oil from barrels; for presses and riveters, cranes, coal mining machines, aerated fuel, aerating water for town supplies, &c. An extended description is given of the pneumatic guns of the United States cruiser "Vesuvius" and the compressed air torpedo gun for sea coast defense, and also of torpedoes actuated by compressed air. There is also an account of compressed air as a motive power and a description of what has been accomplished with it in Paris.

The book is well printed on heavy paper. Most of the engravings, which are all sharp and clear, were made from

photographs taken especially for the book. A copious index is at the close of the volume.

**DIRECTORY OF THE IRON AND STEEL WORKS OF THE UNITED STATES, CANADA AND MEXICO.** Compiled and published by the American Iron & Steel Association, Philadelphia.

James M. Swank's directory of the iron and steel works has always been the closest approach to the ideal of such a publication with which we are acquainted, and is thoroughly appreciated in the trade, by which it is regarded as a standard work. With the growth of the industry the difficulties attending its compilation are growing steadily. It is so thoroughly known that it requires little more than the announcement that a new edition has been issued to commend it to those interested. It contains as usual a full list of the blast furnaces, rolling mills, Bessemer steel works, open hearth steel works, crucible steel works, plate and sheet mills, cut nail factories, stamping works, forges and bloomeries, wire rod and wire mills, wire nail factories, bridge building works, iron and steel shipbuilders, horse nail works, locomotive works, cast iron pipe shops, wrought iron pipe works, car axle makers, car wheel foundries, and car builders. Similar information is furnished for Canada and Mexico.

## MANUFACTURING.

### Iron and Steel.

The Keenan & Hess Mfg. Company have recently completed a plant at Albion, Mich., for the manufacture of light and medium weight gray iron and brass castings. They have a foundry 70 x 160 feet, a two story machine shop 40 x 100 feet, and an engine, boiler and tumbling room 30 x 80 feet, all substantially built of brick. Among other things they manufacture Keenan's patent compound lever molding machine. The members of the company are Geo. J. Keenan, Ellis Keenan and J. H. Hess.

The Crane Iron Company of Catsauqua, Pa., blew in one furnace on June 2.

The machinery of the Minneapolis Rolling Mill Company is now in place and ready for use as quickly as the condition of the iron trade warrants the owners in starting to work.

Last week notices were posted in the mechanical departments of the plant of the Cambria Iron Company, Johnstown, Pa., to the effect that one-half of the employees would be suspended indefinitely. The reason advanced for this action is the coal and coke strikes.

All ore shipments at the Edgar Thomson Steel Works, Bessemer, Pa., have been suspended. Of the nine furnaces at Bessemer, seven are off, one is running on Bessemer and the other on spiegel.

Last week the rod department of the Beaver Falls Mills, Beaver Falls, Pa., was shut down for repairs. During the period of idleness some improved machinery will be introduced which is expected to materially lessen the cost of production of rods.

The Westerman Rolling Mills, at Lockport, N. Y., have been shut down on account of the lack of coal. This will throw a large number of men out of employment until the coal strike is over. It is only a matter of a short time when other Lockport industries will have to do the same unless the labor troubles are adjusted.

The Baltimore Iron, Steel & Tin Plate Company are moving their plant from Clinton and Second streets, Canton, to Locust Point, Md. The firm have secured a lease for three years on the property and plant of the old Coates Rolling Mills, at Locust Point, with the option of purchase.

T. J. Peters has been appointed receiver of the Alabama Iron & Steel Company of Brierfield, Ala., on the application of the secretary of the company. The company

were chartered in 1889 with a capital stock \$2,000,000, and bought out the old Brierfield Iron Company. In 1892 the company gave a mortgage for \$2,000,000 on the entire plant to the Central Trust Company of New York.

The East Lebanon Rolling Mills, at Lebanon, Pa., are again running.

We are advised that the statement that an effort would be made to settle the strike at the plant of the National Tube Works Company, McKeesport, Pa., by arbitration is untrue. The Board of Trade of McKeesport appointed a committee to call on the firm and confer with the management as to the situation. As a result of this conference was held at McKeesport on Monday, the 4th inst., between officials of the National Tube Works Company, a committee of the Board of Trade and a committee of the employees. This meeting was merely a conference for consultation, as requested by the Board of Trade, and was not a meeting for arbitrating the difficulty, as reported.

Some minor changes among the officials of the Pittsburgh Wire Company of Pittsburgh, with works at Braddock, Pa., manufacturers of wire rods, wire nails and plain wire, have recently been made. The present officials of the above named concern are as follows: John Bindley, president, who succeeded A. Dempster; T. W. Fitch, secretary and superintendent, and W. H. Cochrane, treasurer.

No. 2 Furnace of the Carrie Furnace Company of Pittsburgh, which has been idle for about a month on account of the coke strike, blew in on Friday, June 1.

### Machinery.

The Belknap Motor Company of Portland, Maine, are making a large extension to their works for the express purpose of building their large multipolar generators. They are adding 7500 feet of floor space to their present 4500 feet. The new building will be three stories in height.

The Dodge Mfg. Company of Mishawaka, Ind., manufacturers of wood pulleys and power transmitting machinery, have secured quarters at 137 and 139 Purchase street, Boston, where they will carry an extensive stock.

The Pratt & Whitney Company of Hartford, Conn., have established a branch store at 47 Pearl street, Boston, under the management of Alfred L. Lovejoy. They will carry, for the convenience of the trade, a complete assortment of small tools, taps, dies, reamers, screw plates, cutters, punches, &c.

The Mohawk & Hudson Mfg. Company of Waterford, N. Y., shut down their foundry at that place several days last week on account of the shortage of coke, but resumed operations last Monday.

Seaman, Sleeth & Black, proprietors of the Phoenix Roll Works, at Pittsburgh, with the exception of a few days last fall, have been running their plant single turn right along through the business depression, without having to stop for want of orders. This record can be considered as an unusually good one, from the fact that the capacity of this firm for turning out work at this time is more than one-third greater than it was one year ago.

The Enterprise Boiler Company of Youngstown, Ohio, have been given the contract for the stand pipes to be erected in connection with the extension of the water works system of Youngstown. The sum involved in this contract is \$17,495.36.

The Westinghouse Machine Company of Pittsburgh recently purchased a site containing 12 acres at Brinton, on the Pennsylvania Railroad, about 10 miles from Pittsburgh, and will soon commence the erection of large shops at that place. It is the intention of this concern to remove their entire plant from its present location at Twenty fifth and Liberty streets, Pittsburgh, to Brinton, as soon as the new shops have been completed.

The Pratt & Whitney Machine Company will soon ship about 130 machines for gun making to Europe.

F. M. Kennedy & Co. are building a plant at Findlay, Ohio, for the manufacture of goods pertaining to the oil trade. The goods to be manufactured will consist largely of specialties, including oil burners, gripping tools, pumps and valves.

The Enterprise Mfg. Company, Columbiana, Ohio, have embarked in the boiler business and converted the old nut and bolt factory into a boiler works.

The Howard-Bullough Machine Company have decided to erect their works at Pleasant View, near Attleboro, Mass.

The Fairbanks Scale Works, at St. Johnsbury, Vt., who have been working some months on short time, have reduced wages 10 per cent.

Jas. T. Mackay, St. Louis, Mo., manufacturer of the Peerless flue cleaner, has appointed the following agents for the sale of his cleaner: Frank C. Tucker, 26 Cortlandt street, New York City; Howard S. Irons, 614 Betz Building, Philadelphia, Pa., and J. B. Coleman, Elmira, N. Y. Mr. Mackay reports a liberal demand for both new and second hand machinery. He has just issued a new list of second hand machinery, which list will be sent to dealers on inquiry.

Champion Blower & Forge Company of Lancaster, Pa., are running their works to the utmost capacity and are planning for further extension of their premises in addition to the enlargement made a year ago. On last Saturday they received a very handsome order by cable from London, which includes all their leading specialties. Their electric screw plate is having a large sale in Europe, as well as on this continent.

The entire capital stock of the Whitaker Engine & Skein Company of Kenosha, Wis., has been purchased by R. B. Whitaker, who has been at the head of the business since its formation in 1865.

### Hardware.

Charles E. Hunter, an implement dealer, Richmond, Va., is the patentee of the Farmer's Friend plow, which is well known in the Southern States. Mr. Hunter resided in New York prior to 1865, but in that year he went South and settled in Fredericksburg, Va., where he engaged in the manufacture of plows and castings. Mr. Hunter is also connected with the Petersburg Iron Works.

The strike in the bronzing and buffing department of the Russell & Erwin Mfg. Company, New Britain, Conn., has been settled and most of the strikers have returned to work. The men struck for a return of half the reduction in wages which was made some time ago. The officers of the company, however, refused absolutely to accede to their demands, with the above result.

The John Russell Cutlery Company, Turner's Falls, Mass., closed down their works June 2 for the annual inventory and repairs.

The Yale & Towne Mfg. Company, Stamford, Conn., are contemplating an important change in their crane department, and while no definite arrangements have yet been made the company have decided to transfer their crane business to another location. The company are said to have been the first to undertake the manufacture of cranes as a specialty in this country, and notwithstanding the disadvantages of Stamford as a location for the manufacture of heavy machine work the business has grown and flourished, owing mainly to the excellence of the product. The immediate cause of the proposed action, however, is that the hardware business of the company is steadily growing and requires more room for its accommodation, while under usual trade conditions the buildings now occupied by the crane department are inadequate to its needs. These latter buildings are so located relatively to those already devoted to the manufacture of hardware as to make it desirable to utilize them for the contemplated development of the business of the hardware department rather than to erect additional buildings at a greater distance from the latter. Under these circumstances the company have decided that they will promote the interests of all departments by transferring the crane business to another and more favorable location. Overtures have been made by the company to parties in Pittsburgh and Cleveland looking to a transfer of the crane plant to either of these points, its location at which would conduce to great economy, both in the matter of production and transportation, in view of the fact that their supplies of heavy material are obtained chiefly from the vicinity of Pittsburgh, while their product is marketed principally in the great centers of the iron and steel industries, most of which are west of the Alleghenies. In order to further utilize the present plant for the development of their oldest and most important lines—namely, locks and hardware—the company have also decided on the manufacture elsewhere of the wood work required in connection with their post office equipments, the manufacture of

which has heretofore occupied the whole of a large and valuable building.

Brooke, Mack & Peace are now manufacturing a line of saws, including circular, milling, band, concave, grooving, re-saw, veneer and segment saws, at 479 Keap street, Brooklyn, N. Y. They are all practical men, holding positions from superintendent down with Harvey W. Peace Company until that establishment was consolidated with the National Saw Company. The new firm manufacture all kinds of circular saws for cutting wood and metal, a specialty being made of segment saws for cutting veneers. They also make molding knives for cutting wood moldings, and band saws from  $\frac{1}{8}$  to 3 inches in width. Repairing and grinding all kinds of knives is also done.

R. E. Dietz Company, 60 Laight street, New York, advise us that they are doing a very good export trade, mentioning one order for over 1800 street lamps for the city of Para.

The Hartman Mfg. Company of Ellwood City, Pa., manufacturers of Hartman wire specialties, have recently made shipments of fencing to France, South America and Japan. Last week this concern prepared two shipments, aggregating 5 tons of wire, for export to Argentine Republic, South America.

The Cable Lock & Novelty Company of Pittsburgh have been chartered with a capital of \$1000. The directors are A. L. Sailor, Swissvale; Sydney T. Murphy, Osborn, and Ewing B. Kimberly, Pittsburgh.

Baker Chain & Wagon Iron Mfg. Company, Allegheny, Pa., announce that the prevailing scarcity in the supply of coal does not affect the product of their factory in any department, as they use natural gas exclusively and can fill orders promptly.

The Pope Mfg. Company at a meeting of the directors held May 25 decided to remove their general offices from Boston to Hartford, Conn., where the plant is located, in the early autumn. The change will be made as soon as the building for the offices is completed. The removal of the offices to Hartford means the removal to that city of about 100 officers and clerks and their families. The new building will cost in the neighborhood of \$50,000. The building will be of exceptionally handsome design, rectangular in shape, 54 x 104 feet, three stories in height, with a well lighted basement, which will be asphalted and made thoroughly dry so as to be used for the storage of records, &c. All the partitions in the building will be either of brick or steel lathing, fastened to light channel iron and the whole imbedded in adamant or Windsor cement, making a solid fire proof partition but  $1\frac{1}{2}$  inches thick. The building will be heated and ventilated by a combination of the blower and direct radiation systems.

#### Miscellaneous.

The Champion Iron Company, Kenton, Ohio, in a recent letter state that they have just secured contract for furnishing the steel and iron work for the Welch, W. Va., court house and jail, and are now furnishing the iron work for the Cadiz, Ohio, court house, the new Carnegie Library, Pittsburgh, and the State Asylum at Harrisburg, Pa.

Charles Fowler of Rome, N. Y., has sold his plating works in that city to William J. Doyle and has accepted the position of foreman in the plating department of the Rome Bathtub Factory.

It is semi-officially reported that the Westinghouse Electric & Mfg. Company of Pittsburgh secured orders for new business to the extent of \$800,000 during the month of April.

The New Castle Galvanizing & Chemical Company, New Castle, Pa., have been chartered, with a capital stock of \$10,000. The directors are A. Johnston, D. R. Jenkins and H. Copewell, all of New Castle.

The works of the Heath Rail Joint Company, at West Superior, Wis., have been operated for about a year making the Heath rail joint. It has been furnished to 56 different railroads during that time. The production has been in the neighborhood of 75,000 joints, of which number about 25,000 have been made in the last six weeks. The company are now building a new factory at Chicago Heights, and will move into it in about 60 days or as soon as the new machinery is finished, which is now under contract. The new factory will have a much larger capacity than the one at West Superior.

## Philadelphia.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, Pa., June 5, 1894.

There is very little of interest to report in the Iron and Steel trade, business being restricted to small lots for quick delivery, except in Foundry and Mill Irons, which are selling somewhat more freely and at slightly better prices. The general situation, however, is dominated by the condition of the Coal trade, and as matters in that line cannot continue as they are for any length of time, the Iron and Steel trades are liable to be more or less influenced by its settlement. The general effect will probably be somewhat lower prices for Steel in all its various forms, but it is not likely that the low prices of March and April will be seen again this year, although we are sorry to say that there is nothing in sight to promise any material increase in the demand. Consumers of Finished Material seem to be able to get everything they need on the basis of about  $1\frac{1}{4}$ ¢ f.o.b. cars mills, for Plates, Angles, Bars and specialties of that class, and as that can be done with less than one-half of a normal output, it is not calculated to inspire very bright expectations in regard to the outcome of events in the immediate future. Higher cost will help to keep prices from reacting to any serious extent, but at best the situation is not encouraging.

**Pig Iron.**—There is more doing in Pig Iron, and prices, if not fractionally higher, are certainly well maintained. There is no very strongly defined increase in the demand, but with so many furnaces banked, and the prospect of higher freights from the South and West, holders are less urgent in making sales, unless at figures that come pretty close to \$11.77 for No. 2 X, and \$10.50 @ \$10.75 for ordinary to good mill Irons. Several sales of 1000 tons each and upward have been made of the last mentioned at \$10.50, which appears to be an inside quotation for that class of Iron, although there are full supplies at that figure for Philadelphia deliveries and at 25¢ @ 30¢ less at points such as Harrisburg and York. Bessemer is virtually out of the market, but, as consumers are supplied for the next 30 or 60 days, there is no urgency to place new orders. General quotations for Philadelphia and equivalent points are about as follows:

Bessemer, spot.....	\$13.50 @ \$14.00
Bessemer, July, August and September.....	12.00 @ 12.50
Standard No. 1 Foundry X ..	12.50 @ 12.75
Standard No. 2 Foundry X ..	11.50 @ 11.75
No. 2 Plain.....	10.75 @ 11.00
No. 1 Soft.....	11.50 @ 11.75
No. 2 Soft.....	10.75 @ 11.00
Standard Gray Forge.....	10.50 @ 10.75
Ordinary.....	10.25 @ 10.50

**Steel Billets.**—No business has been done so far as known for some time past. Those who have Billets and coal are not disposed to buy more at the high figures now quoted, while those who are out of Billets are also pretty well out of coal, and are therefore not inclined to do anything. Moreover, there are a good many Billets due on old contracts, so that there are plenty of reasons for not buying while things are as unsettled as they are today. June deliveries quoted \$19.50 @ \$19.75, later dates \$18.50 @ \$19.

**Finished Material.**—Those who can make deliveries are meeting with a good demand at better prices, say 1.30¢ @ 1.40¢, delivered, for Bars, Plates and Angles, but no large lots are wanted, simply enough to tide over what is believed to be a temporary scarcity. This

being said, there is little that can be said in addition, as no one knows what new turn may be developed within the next two or three weeks. There is nothing to indicate any material increase in the demand, in which case if the strike is settled it is probable that prices will fall off again, as there are plenty of mills that would shade today's prices if they had coal enough to run their mills; and besides that, liberal concessions would be made now, providing deliveries are not required until July or later. Temporarily prices are strong, with demand for early deliveries fully equal to the supply, but very little demand for deferred deliveries. General quotations, delivered, are about as follows:

Grooved Skelp, delivered.....	1.20¢ @ 1.25¢
Standard Refined Bars ..	1.30¢ @ 1.40¢
Medium quality.....	1.20¢ @ 1.25¢
Tank Steel.....	1.30¢ @ 1.40¢
Heavy Plates.....	1.30¢ @ 1.40¢
Shell.....	1.50¢ @ 1.60¢
Flange.....	1.60¢ @ 1.80¢
Angles.....	1.30¢ @ 1.40¢
Beams and Channels .....	1.40¢ @ 1.60¢

**Old Material.**—The market is extremely quiet, owing to so many of the mills being shut down. Prices are nominally as follows, but pressure to sell would probably lead to low figures without securing much business:

Heavy Melting Steel.....	\$10.00 @ \$11.00
Light Melting Steel.....	8.00 @ 9.00
No. 1 Wrought Scrap.....	10.00 @ 11.00
Machinery Cast.....	9.50 @ 10.00
Wrought Turnings.....	8.00 @ 8.50
Cast Borings.....	6.00 @ 6.50
Old Iron Rails.....	12.00 @ 12.50

## Cincinnati.

(By Telegraph.)

Office of The Iron Age, Fifth and Main Sts., CINCINNATI, June 6, 1894.

The situation in the Pig Iron market has been much the same as the previous week. Some furnaces with Pig Iron to sell have met the demand quite freely, but there were no large transactions, and yet the aggregate of the jobbing sales was considerable, and while the bulk of trade was for Foundry Coke Iron, yet there were larger proportionate sales of Southern Charcoal Iron. At the close there are comparatively few Southern furnaces that have Iron to sell, and they are talking higher prices, but the scarcity of fuel is decreasing the demand as well as the supply, for many of the jobbing foundries are closing because they cannot get Coke or Coal. The advance in freight rates by the Northern railroads after the middle of June restricts business, but the main detriment to trade is the scarcity of fuel and the uncertainty of how long it will last. There is considerable urgency to obtain Iron which is coming to buyers on contracts. There is an unusually good demand for White Iron as well as for Soft Iron, and buyers are willing to pay regular grade prices for what they want, although it usually sells for much less. The market closes strong. Quotations are unchanged, but are scarcely more than nominal, as follows:

#### Foundry.

Southern Coke, No. 1.....	\$10.25 @ \$10.50
Southern Coke, No. 2.....	9.25 @ 9.50
Southern Coke, No. 3.....	8.75 @ 9.03
Ohio Soft Stone Coal, No. 1.....	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2.....	14.00 @ 14.50
Lake Superior Coke, No. 1.....	12.50 @ 13.00
Lake Superior Coke, No. 2.....	11.50 @ 12.00
Hanging Rock Charcoal, No. 1.....	17.00 @ 17.50
Hanging Rock Charcoal, No. 2.....	16.50 @ 17.00
Tennessee Charcoal, No. 1.....	18.00 @ 18.50
Tennessee Charcoal, No. 2.....	12.00 @ 12.50

#### Car Wheel and Malleable Irons.

Standard Southern Car Wheel ..	16.25 @ 17.00
Lake Superior Car Wheel and Malleable.....	16.25 @ 16.75

#### Forge.

Gray Forge.....	8.50 @ 8.75
Mottled Coke.....	6.25 @ 6.50

# Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street,  
Chicago, June 6, 1894.

The stoppage of so many Eastern mills for lack of fuel is diverting business into unusual channels. Orders which have hitherto been sent to Eastern manufacturers are now going to local merchants, who are able to make prompt shipment from their large stocks. Eastern consumers are sending inquiries here. Even the local Structural shops are receiving business in this way from remote localities. Shipments have, for instance, been made to New York and New England within the past week. The advance in freight rates which will take place quite generally on the 15th is stiffening the price of Iron and Steel, even on products which have not been seriously affected by the scarcity of fuel. Ohio rates on Pig Iron will be restored to \$2, an advance of 40¢ per ton. East and West bound rates on Finished Iron and Steel are also to be restored. Southern Pig Iron will be advanced, but how much is not known at present.

**Pig Iron.**—The market is hardening. Large sales of local Coke Iron have been made at firm prices and offers are refused which would have been accepted only two weeks since. Manufacturers again appear to be in command of the situation and consumers are gradually recognizing this fact. Stocks of Bessemer Pig Iron at many points through the West have been completely cleaned up and the only stock now held is that of the Illinois Steel Company, who have refused to sell any part of it to urgent Pittsburgh buyers. Southern Coke is quiet, but this is probably due more to the fact that the soft grades are practically out of the market than that consumers are not willing to buy. Such Iron as is now selling is on the basis of a price at the furnace and not delivered, as makers will not take chances of an advance in freight rates. Quotations of Soft Irons are nominal at present, as so few furnaces have any to sell. Ohio Silvery Iron is considerably higher, owing to increased inquiry and the advance in freight rates. Sales of Lake Superior Charcoal Iron are reported in somewhat larger quantity than for several weeks past. Bankrupt stocks are now disappearing and the market is working into better shape. Quotations are given as follows for cash:

Lake Superior Charcoal.....	\$15.00 @	\$15.50
Local Coke Foundry, No. 1....	11.25 @	11.50
Local Coke Foundry, No. 2....	10.50 @	11.00
Local Coke Foundry, No. 3....	10.00 @	10.50
Local Scotch.....	11.50 @	11.75
Ohio Strong Softeners No. 1....	13.00 @	13.50
Southern Silvery, No. 1.....	.....	.....
Southern Silvery, No. 2.....	.....	.....
Southern Coke, No. 2.....	10.00 @	10.35
Southern Coke, No. 3.....	9.75 @	10.00
Southern, No. 1, Soft.....	10.25 @	10.50
Southern, No. 2, Soft.....	10.00 @	10.25
Tennessee Charcoal, No. 1....	.....	.....
Tennessee Charcoal, No. 2....	.....	.....
Alabama Car Wheel.....	17.50 @	18.00
Jackson County Silvery.....	15.00 @	16.00
Coke Bessemer.....	12.00 @	.....
Other Ohio Silvery.....	14.00 @	14.50

**Bars.**—Considerably better business is enjoyed by manufacturers. Good sales have been made covering four to six months' deliveries. The market on Bar Iron is a shade stronger, as manufacturers report that a very slight concession will now secure even desirable orders. Prices can still be quoted at 1.05¢ @ 1.15¢, Chicago, according to the location of the mill, quantity, &c. Soft Steel Bars are very firm and mill shipments are quoted at 1.35¢ @ 1.40¢, Chicago. Consumers of Steel are mak-

ing more urgent inquiries as they find the sources of supply narrowing. Jobbers quote small lots from stock at 1.30¢ and upward for Bar Iron, and 1.50¢ upward for Soft Steel Bars, according to quantity.

**Structural Material.**—It is now difficult to get any quantity of material for mill shipment, as the few works running are very full of orders for early delivery. Some building schemes of considerable importance are delayed in the hope that prices and deliveries may shortly become easier. The Lake Street Elevated Railroad extension, which will call for considerable quantity of bridge work, has been secured by A. & P. Roberts & Co. of Philadelphia. The Northwestern Elevated contract has not been placed and it is understood that some time will elapse before the right of way is secured so that construction can proceed. Quotations on mill shipments, Chicago delivery, are as follows: Beams and Channels, 1.50¢; Tees, 1.65¢; Angles, 1.45¢; Universal Plates, 1.45¢. Small lots from stock sell at 1.80¢ @ 1.90¢ for Beams, 1.50¢ @ 1.60¢ for Angles, and 1.70¢ @ 1.80¢ for Tees.

**Plates.**—So few mills are now running that those active are asking prices so close to store prices that consumers are drawing supplies largely from dealers and thus securing more certain deliveries. Stocks here are large enough to supply the trade for several months, and dealers consequently report business very satisfactory. Mill shipments, Chicago delivery are quoted as follows: Tank Steel, 1.45¢ @ 1.50¢; Flange Steel, 1.65¢ @ 2.10¢; Fire Box, 2.50¢ @ 5¢. Dealers are disposed to be stiff. They are not inclined to take any large amount of business, but are carrying the small trade. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.80¢ @ 1.90¢; Tank Steel, 1.60¢ @ 1.85¢; Flange Steel, 2.10¢ @ 2.35¢; Boiler Tubes, 75 ¢ off.

**Sheets.**—Black Sheets are in good demand. Large buyers are again taking hold, and in some cases are contracting at advanced prices rather than longer delay making their purchases. Black Sheets for tinning are in particularly good demand, and heavy sales have been made within the past two weeks. Mill shipments of No. 27 Common Stove Pipe Iron, Chicago delivery, continue to be quoted at 2.40¢ @ 2.45¢, and Soft Steel Sheets at 2.50¢ @ 2.55¢. Small lots from stock are selling at 2.65¢ @ 2.75¢. Galvanized Iron is in excellent demand, with prices very firm at 75 and 10 ¢ off on mill shipments. Sheet Copper is unchanged at 14¢ to large buyers, with no discount.

**Merchant Steel.**—Orders for mill shipments have not increased to any extent, but jobbers have had notably larger trade. One or two inquiries have come up recently for prices on season contracts, but none so far have been closed. We quote mill shipments, Chicago delivery: Smooth Finished Machinery and Tire, 1.70¢ @ 1.80¢; Open Hearth Spring Steel, 1.85¢ @ 1.90¢; Bessemer Machinery, 1.55¢ @ 1.60¢; Bessemer Tire, 1.45¢ @ 1.50¢; Ordinary Tool Steel, 6¢ @ 7¢; Specials, 12¢ and upward.

**Billets and Rods.**—No Billets are now to be had here for prompt shipment, but manufacturers are beginning to make sales for July delivery, and prospects are very favorable for the sale of the whole month's output within a week or

two. Quotations are maintained at \$19.50 @ \$20. Inquiries for Wire Rods are in hand for July, August and September delivery. Prices are maintained at \$25.25 @ \$25.50.

**Rails and Track Supplies.**—A very fair week's business has been entered in Steel Rails, but only in small lots, which have seldom run above 500 tons. Quotations for standard Steel Rails are \$25 @ \$27; Steel Splice Bars, 1.35¢ @ 1.40¢; Track Bolts with Hexagon Nuts, 2.15¢ @ 2.25¢; Spikes, 1.75¢ @ 1.90¢; Links and Pins, 1.65¢ @ 1.70¢.

**Old Rails and Car Wheels.**—A large sale of Old Iron Rails is reported at a near by point but equal to \$9.60, Chicago. Old Steel Rails have been very quiet, with nominal quotations continued at \$6.50 for short pieces, and \$9.50 @ \$10 for long lengths. Old Car Wheels are scarce. Stocks are held in strong hands. Nominal quotations are still \$10 @ \$10.50, at which price Wheels are now considered very cheap.

**Scrap.**—Consumers are making offers lower than our quotations, but dealers claim thus far very little stock has been picked up at the lower rates. Dealers quote the following selling prices per net ton; Railroad Forge, \$9; Dealers' Forge, \$8 @ \$8.50; No. 1 Mill, \$6.50; Pipes and Flues, \$6; Heavy Cast, \$7 @ \$7.50; Stove Plate, \$5 @ \$5.50; Fish Plates, \$10; Horseshoes, \$9; Mixed Steel, gross ton, \$5.

**Metals.**—Copper is a little lower, and carload lots of Lake are now quoted at 9½¢ with casting brands at 9¼¢. Spelter is held at 3.25¢ @ 3.30¢, with producers willing to make contracts for shipments throughout the year at 3.30¢. Pig Lead is lower and is now quoted at 3.10¢.

# St. Louis.

(By Telegraph.)

Office of *The Iron Age*,  
Bank of Commerce Building,  
St. Louis, June 6, 1894.

**Pig Iron.**—The only feature of interest is the scarcity of No. 1 Foundry. The output of this grade of Iron is very limited, and \$8.25 @ \$8.50 is now quoted for prompt shipment. Soft Irons are also showing signs of scarcity, and are firmer in consequence. The consumption of Iron is limited, which is, however, offset by the limited production. The unfavorable feature of the market is the Coal strike, which now tends to hold back shipments. Consumers being unable to obtain their usual supply of Coal, Coke, &c., are also reducing their shipments of Iron, and furnaces have no alternative but to hold the Iron for further instructions. Prices are firmer all along the line, but are not as yet quotably higher. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry.....	\$11.00 @	\$11.25
Southern Coke, No. 2 Foundry.....	10.00 @	10.25
Southern Coke, No. 3 Foundry.....	9.75 @	10.00
Southern Car Wheel.....	17.00 @	18.00
Lake Superior Car Wheel.....	16.25 @	16.50
Ohio Softeners.....	14.25 @	14.50

**Bar Iron.**—The inability of some mills to obtain sufficient Coal to operate their plants has brought about a reduced production, which has quite naturally affected prices. Mills who have Iron for sale are filling orders at 1.15¢, f.o.b. cars East St. Louis. There are no large orders offered and it is doubtful if any of the mills are in a position to accept anything outside of carload business. Jobbers ask 1.30¢ @ 1.35¢, according to quantity.

**Barb Wire.**—The increased cost of Coal, which is only obtainable by paying at least 150 % more than it could be bought for 30 days since, has caused a general stiffening in the price of Barb Wire. Mills now ask \$1.90 for Painted, with 40¢ per hundredweight additional for Galvanized. Trade is not heavy, but there is sufficient business going to hold the market firm as above quoted.

**Wire Nails.**—The manufacturers of Wire Nails are evidently standing by the agreement made in Pittsburgh two weeks since. None of them are offering Nails less than \$1.20 in carload lots, and some quote \$1.25 and even as high as \$1.30. Considering the season the demand is excellent.

**Rails and Track Supplies.**—There is considerable inquiry for Old Iron Rails, but which as yet has not developed into sales. The current asking price is \$10, f.o.b. St. Louis. Steel Rails are quoted at \$26 @ \$27. Railroads are buying more liberally and Track Supplies and general equipment are in better shape. We quote as follows: Splice Bars, 1.35¢; Spikes, 1.75¢; Bolts, Square Nuts, 2.05¢; with Hexagon Nuts, 2.15¢; Steel Links and Pins, 1.65¢; Iron, 1.75¢.

**Pig Lead.**—Dullness has been the characteristic feature of this market during the past week. In the absence of any large business the price of lead has dropped to 3.05¢, at which figure the market seems stationary.

**Spelter.**—There is a slight improvement noticeable in this metal. The demand is better and the price has been advanced to 3.20¢, although it would doubtless be shaded to 3 17½¢ if the order was a desirable one.

## Pittsburgh.

(By Mail.)

Office of The Iron Age, Hamilton Building,  
PITTSBURGH, June 5, 1894.

The volume of business in Iron and Steel is being steadily restricted by the Coal and Coke strikes, and every day that passes without seeing a settlement of the troubles finds additional plants closing for want of fuel. Probably never before in the history of the Iron trade, and especially in Pig Iron, has production been so small as at present, and never has there been such a cleaning up of stocks of all kinds as during the last month or six weeks. Material of different kinds that has been lying around for years has been put to some use, and stocks of everything are practically exhausted. This is one of the most favorable features so far as the future is concerned, and if good crops are realized this year, it will mean that the railroads must repair and replace equipment, and it is well known that when the railroads are buying material other consumers are right in line with them. Higher prices for prompt deliveries continue, with none of the mills in position to make shipments as fast as desired on account of scarcity of fuel. Additional plants in this city have closed during the week for the above reason.

**Pig Iron.**—The market is bare of sales and of material as well, a sale of 500 tons of Bessemer for spot delivery at \$13.25, Pittsburgh, being the largest transaction of the week. Reports from Ore districts show the stocks of available Bessemer Ores are very limited, and this is advanced as an additional reason for the belief that Bessemer Iron will bring better prices during the last

half of the year than prevailed during the first three or four months. Mill Iron is stiffening in price, and \$9.75, Pittsburgh, is the minimum price today, a sale of 500 tons having been made at that figure last week. There is little or no demand for Foundry Iron, but in spite of this furnaces are asking more money, and it is doubtful if \$10.75, Pittsburgh, for No. 2 could be shaded. In the Pittsburgh district only 4 or 5 stacks out of 26 are active, Carrie No. 2 having gone in last week. No additional contracts for Pig Iron for late delivery having been closed, for the reason that the ideas of the buyers and the furnacemen are very far apart. In the present situation, with no transactions occurring, it is hardly worthwhile to make quotations. For spot deliveries the following prices are quoted:

Neutral Gray Forge.....	\$9.75 @ \$10.00, cash.
All-Ore Mill.....	9.75 @ 10.00 "
No. 1 Foundry.....	11.50 @ 11.75 "
No. 2 Foundry.....	10.75 @ 11.00 "
Bessemer.....	13.25 @ 13.50 "

We note a sale of 300 tons of No. 1 Foundry made early last week at a price equal to \$11.20, Pittsburgh.

**Billets.**—At this writing the only Steel plants in this district in operation are Hainsworth and Homestead, the other four, consisting of Duquesne, Shoenberger & Co., Jones & Laughlins, Limited, and McKeesport, being idle for want of Coal and Pig Iron. Jones & Laughlins, Limited, will start Wednesday or Thursday for a few days' run. In the Wheeling district Wheeling Steel & Iron Company were on last week, but this week Riverside, Wheeling, Mingo and Bellaire are all off. The supply of prompt Billets is about exhausted, with little or no demand on account of so many concerns being closed. Nothing is being done in Steel for forward delivery, the views of buyers and sellers being widely apart. We quote prompt Billets at \$19 @ \$19.25. We note a sale of 200 tons at \$19, and one of 100 tons at \$19.25 at mill.

**Ferromanganese.**—We note a sale of 50 tons of domestic by the local mill at \$53, delivered, equal deliveries in June and July.

**Plates.**—An order for 300 tons of Tank Steel was placed with a local mill last week. The demand is for small lots, which added up represent a very fair tonnage. Prices continue firm and the market is represented by the following quotations: Tank, 1.25¢ @ 1.30¢; Flange, 1.45¢ @ 1.60¢ according to order; Shell, 1.40¢ @ 1.50¢; Marine, 1.60¢ @ 1.70¢; Fire Box, 2¢ @ 4¢, according to quality.

**Structural Material.**—The demand for Beams is excellent, both local mills having more orders on their books than at any time for some months. The Homestead plant uses gas principally for fuel and has been only slightly affected by the Coal strike. Prices continue firm and we have advanced quotations slightly on Beams. We quote as follows: Beams and Channels up to 15 inches, 1.30¢ @ 1.35¢; Angles and Universal Plates, 1.25¢ @ 1.35¢; Tees, 1.35¢ @ 1.40¢.

**Muck Bars.**—Standard grade Muck Bars have advanced about \$1 per ton in price. We note sales as follows: 500 tons at \$19.50, 300 tons at \$19.75 and 100 tons at the same price, delivered at buyer's mill.

**Bars.**—Stocks are badly broken, many of the mills being entirely closed, while others are running in a limited way as they can obtain fuel. There is a fair demand for Steel and Iron Bars

in small lots, mills refusing to quote on large orders, not being able to promise deliveries. We quote Iron Bars at 1.10¢ and Steel Bars at 1.20¢ @ 1.25¢, with the usual extras.

**Merchant Steel.**—The demand is limited and mills are unable to guarantee shipments. Makers are refusing to book orders for late delivery at present prices. We quote: Bessemer Machinery, 1.35¢ @ 1.40¢; Open Hearth Machinery, 1.55¢ @ 1.65¢; Open Hearth Spring, 1.70¢ @ 1.75¢; Cold Drawn Steel Shafting, 2.50¢, base; Tool Steel, 5¢ @ 7¢ for ordinary grades.

**Pipes and Tubes.**—No large contracts have been placed during the week. For prompt shipments prices have advanced from 10 % to 15 %. The strike at the plant of the National Tube Works Company has not been arranged.

**Skelp Iron and Steel.**—We note a sale of 200 tons of Grooved Steel Skelp at 1.20¢, four months. We quote as follows: Steel Skelp, 1.15¢ @ 1.20¢; Sheared Steel Skelp, 1.25¢ @ 1.30¢; Grooved Iron Skelp, 1.30¢ @ 1.35¢; Sheared Iron Skelp, 1.40¢ @ 1.45¢.

**Wire Rods.**—No transactions are reported, most of the mills being closed on account of the Coal strike.

**Wire Nails.**—The pooling arrangement recently entered into by a majority of the Wire Nail makers has been perfected. The allotment feature prevails and mills desiring to make more than their percentage pay so much per keg, said to be 10¢, into the treasury. Any concerns not turning out their allotment are to be paid this amount. The established price of \$1.10 base is being held, while some mills ask 5¢ additional. Cut Nails are ruling at 95¢ @ \$1 on 55¢ averages.

**Freight Rates.**—Taking effect Friday, June 15, 1894, the following rail and lake rates from Pittsburgh and points taking Pittsburgh rates via Cleveland will prevail:

From Pittsburgh and points taking Pittsburgh rates to	Rates in cents per 100 pounds.						Iron and Steel.	
	1	2	3	4	5	6		
							L. C. L.	C. L.
Albion, Mich. ....	39	36	24	18	15	13	13	
Alpena, Mich. ....	55	47	34	23	21	17	18	
Bav City, Mich. ....	39	34	24	18	16	14	14	
Cheboygan, Mich. ....	55	47	34	23	21	18	18	
Chicago, Ill. ....	42	37	27	20	17	15	15	
Detroit, Mich. ....	31	28	20	14	13	11	11	
Detroit, Mich. ....	30	27	20	13	12	10	10	
Duluth, Minn. ....	75	62	50	36	29	25	24	
Escanaba, Mich. ....	60	52	45	30	23	20	20	
Green Bay, Wis. ....	55	47	34	23	21	18	18	
Hancock, Mich. ....	70	57	50	36	29	25	24	
Ithaca, Mich. ....	45	40	30	23	19	17	17	
Jackson, Mich. ....	37	34	25	17	15	12	12	
Jackson, Mich. ....	35	32	24	16	14	11	11	
Joliet, Ill. ....	45	40	29	21	18	16	16	
Junc. Yard, Mich. ....	31	28	20	14	13	11	11	
Junc. Yard, Mich. ....	30	27	20	13	12	10	10	
Lexington, Mich. ....	42	37	27	20	17	15	15	
Lansing, Mich. ....	41	37	27	19	17	14	14	
Marquette, Mich. ....	62	52	37	27	23	20	20	
Monroe, Mich. ....	34	31	23	16	14	12	12	
Monroe, Mich. ....	33	30	23	15	13	11	11	
Port Huron, Mich. ....	34	31	23	16	14	12	12	
Rochester, Mich. ....	34	31	23	18	16	14	14	
St. Paul, Minn. ....	85	72	56	37	31	25	24	
S. St. Marie, Mich. ....	46	39	34	24	20	17	17	
Wixom, Mich. ....	37	34	24	17	15	12	12	
Wixom, Mich. ....	35	32	24	16	14	11	11	

Taking effect on the above date Skelp Iron in carload lots of 12 gross tons and over, from Pittsburgh and points taking Pittsburgh rates, to Warren, Ohio, will be 75¢ per gross ton.

**Barb Wire.**—The demand for Plain and Barb Wire holds up remarkably well and prices are showing a firmer tendency. We quote Four-Point Galvanized at \$2.10 @ \$2.15, in carload lots, and Painted at \$1.75 @ \$1.80. Plain Wire for prompt shipment is higher, and we quote at \$1.45 in carload lots.

**Connellsville Coke.**—In the Connellsville region for the week ending Saturday, May 26, there were 2987 active and 14,576 idle ovens, with a total estimated production of 30,393 tons. Compared with the production of the previous week this was an increase of 13,943 tons. In the active list of ovens there was an increase of 911 ovens. Fair progress is being made by the Coke operators in getting their ovens in operation, each day seeing an additional number active over the preceding day. One prominent operator states that in his belief the strike will be ended within a week. As high as \$3 7/8 ton is being paid in Pittsburgh for Furnace Coke and \$4 @ \$4.50 for Foundry Coke.

R. W. Carroll, for the past eight years Pittsburgh manager for the American Tube & Iron Company, with mills at Middletown, Pa., and Youngstown, Ohio, has severed his connection with that concern, and has been succeeded by D. B. McClelland, also connected with the Pittsburgh office for some years. Mr. Carroll has made arrangements to engage in other business lines, and will make his headquarters in New York City, but will retain an office at 129 Fourth avenue, Pittsburgh. Mr. Carroll has made hosts of friends in the trade who will unite in wishing him abundant success in all his undertakings. The offices of the American Tube & Iron Company have been removed from the Monongahela House, Smithfield and Water streets, Pittsburgh, to Rooms 409-410 Ferguson Building, Pittsburgh.

Last week notices were posted in various parts of the mechanical departments of the Cambria Iron Company, Johnstown, Pa., stating that one-half of the employees would be indefinitely suspended. The Steel department and blooming mill are in operation this week. About 1400 men are employed in the mechanical departments, and the cause of the cutting down of the force is that all present improvement work is completed and no new work has been taken up.

The plant of the Carbon Steel Company, Pittsburgh, Pa., continues in full operation, this concern using natural gas exclusively for fuel.

## New York.

Office of *The Iron Age*, 96-102 Reade street, }  
New York, June 6, 1894. }

**Pig Iron.**—Although some of the Southern furnace companies have advanced their asking prices there is no evidence that buyers are paying more. There is some scarcity, however, in Soft grades. While the threatened advance in freight rates has stimulated shipments the fact remains that the current demand is not heavy. We quote standard brands \$12.50 @ \$13 for No. 1; \$11.25 @ \$12 for No. 2, at tidewater. Southern Iron, same delivery, \$11.50 @ \$12.25 for No. 1; \$10.50 @ \$11 for No. 2; \$10 @ \$10.25 for No. 3; \$10.25 @ \$10.75 for No. 2 Soft, and \$10.50 @ \$11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is \$9.75 @

\$10.25; Bessemer Pig, prompt delivery, \$12 @ \$12.50, at furnace.

**Cast Iron Pipe.**—The Philadelphia contract for 48 inch Pipe has been taken by the McNeal Company at \$17.80.

**Ferromanganese.**—We continue to quote \$52 @ \$52.50 for foreign Ferromanganese in small lots.

**Steel Rails.**—The market is very dull, with quotations for standard Rails at \$24.80, tidewater, for light sections \$22 @ \$24, tidewater, and for Girder Rails \$21 @ \$24 at mill. We note elsewhere the purchase by the Lackawanna Steel & Iron Company of the R. H. Coleman interests in the Cornwall Ore Banks. It is the most significant event for a long time in the Eastern Steel Rail trade.

**Track Material.**—We quote as follows for small lots: Spikes, 1.50¢ @ 1.70¢; Fish Plates, 1.20¢ @ 1.40¢; Track Bolts, Square Nuts, 2¢ @ 2.10¢, and Hexagon Nuts, 2.10¢ @ 2.30¢, delivered.

**Billets and Rods.**—The market is quiet with quotations nominally at \$19 @ \$19.50 for domestic. Wire Rods are \$27 @ \$27.50, tidewater.

**Manufactured Iron and Steel.**—Agents of Western mills are generally asking higher prices for prompt delivery, but the volume of business is small and generally speaking Eastern mills are lower. The latter are getting a moderate advance on material for immediate delivery, and on small lots to those who are not regular customers a round figure is charged. But on the whole the demand is light and few sellers appear to have much confidence in the higher figures named by their competitors. It is pretty certain that some of the agents who have rigidly adhered to the limits set them have not captured many orders. The report has been circulated in the local trade that the Passaic Rolling Mill Company, at Paterson, had been forced to close down and could not fill orders. There is no truth in this report. The mill is running and orders are being taken and filled. Figures have just gone for a building in Buffalo which will take about 1000 tons of Structural Material. The contract for Washington post office, involving about 1300 tons, has been taken by a Western concern. We quote: Beams up to 15-inch, 1.40¢ @ 1.50¢ for round lots; Angles, 1.30¢ @ 1.35¢; Universal Mill Plates, 1.25¢ @ 1.35¢; Tees, 1.50¢ @ 1.60¢; Channels, 1.40¢ @ 1.50¢, on dock. Steel Plates are 1.30¢ @ 1.35¢ for Tank; 1.40¢ @ 1.45¢ for Shell; 1.60¢ @ 1.65¢ for Flange, and 1.75¢ @ 2¢ for Fire Box, and 2¢ @ 2.25¢ for Locomotive Fire Box, on dock; Refined Bars are 1.20¢ @ 1.9¢, on dock, and Common 1.10¢ @ 1.20¢; Soft Steel Bars are 1.20¢ @ 1.30¢; Scrap Axles are quotable at 1.35¢ @ 1.50¢, delivered; Steel Axles, 1.35¢ @ 1.50¢, and Links and Pins, 1.40¢ @ 1.60¢; Steel Hoops, 1.40¢ @ 1.50¢, delivered; Cotton Ties, 60¢ @ 70¢ 7/8 45-lb bundle, tidewater; Machinery Steel, 1.20¢ @ 1.40¢; Toe Calk, 1.80¢ @ 1.90¢, and Sleigh Shoe, 1.60¢ @ 1.75¢, delivered.

**Old Material.**—Melting stock is being offered at \$7.50 @ \$8. Selected Old Steel Rails fit for rerolling are offered at \$9, while those fit only for remelting are offered in small quantities at \$8.50 @ \$8.75. Old Street Rails are offered at \$7.50 @ \$8.

C. Mackintosh has severed his connection as New York agent of the McDaniel & Harvey Company. He has opened an

office on his own account at 61 Beekman street, corner of Gold street, where he will transact a general commission business in Galvanized and Black Sheets, Spanish Tile for the Cuba trade, and Black Plate for tinning. He will also buy for a number of large concerns in New York and in the New England States.

## Metal Market.

**Pig Tin.**—Prices have moved slowly but almost steadily downward, and show a decline for the week under review of about 0.20¢. The fall is due in part to lower London market, but increasing supplies and dull general trade have helped in some degree. Spot stocks increased last month to the extent of about 305 tons. Thus far this month 225 tons have arrived. There are now afloat 1900 tons. The available supply for early delivery is about 3000 tons, or 750 tons larger than a month ago. European and American visible supply combined was 18,983 tons June 1, showing an increase of 2593 tons since January 1. At the end of the week the tone was somewhat firmer, but 19.80¢ @ 19.85¢, net cash, for 5 ton lots and 20¢ for ordinary jobbing parcels seemed to have been full value.

**Copper.**—Orders have been placed for quite a large quantity of Lake Superior Ingot for delivery several months ahead. The amount is understood to be about 10,000,000 lbs. The price is known to be 9¢. The deal has served to unsettle the general market and a higher price than 9¢ is strictly the exception at present. The chances are that bids of 9¢ for round lots, delivery two or three months hence, would be accepted. Liberal quantities of best Electrolytic are going forward on sales made some time ago at 9¢, but it is doubtful if any considerable quantity can now be placed at that price. For common casting stock there is little demand at present and market value is uncertain. Spot stock, which seems rather scarce, is quoted at 8.90¢ @ 9¢, and near future deliveries at 8 3/4¢. Electrolytic for early delivery is also scarce and firm at 9¢, but possibly could be had at a shade less for July or later delivery. Exports of Copper during April and in the ten months ending April 30 are stated as follows in the last monthly report of the Bureau of Statistics:

	Ore.	1894.	1893.
	Tons.	Tons.	Tons.
In April .....	291	3,673	
Ten months.....	23,302	33,008	

	Ingot.	1894.	1893.
	Lbs.	Lbs.	Lbs.
In April .....	11,475,135	3,084,407	
Ten months.....	168,898,854	24,411,939	

The distribution of Ingot during the ten months was as follows:

	1894.	1893.
	Lbs.	Lbs.
To United Kingdom.....	61,069,038	2,308,259
To Germany.....	21,164,702	2,863,142
To France.....	26,619,864	9,769,766
To other Europe.....	59,427,139	9,261,529
To other countries.....	617,311	209,252

Imports of Copper Ore, reduced to equivalent in fine Copper, were during the ten months 6,599,070 lb, against 7,047,408 last year. Imports of Pigs, Bars, &c., were 3,136,035 lb and 3,910,985 lb respectively.

**Pig Lead.**—A more active market has been experienced. At from 3.30¢ down to 3.25¢ probably 500 to 600 tons have been placed, chiefly for July and later delivery. The greater portion was sold at the lowest of the prices noted

above, but the market is now showing better tone, with 3 25¢ @ 3.30¢ quoted at the close and sales reported of eight carloads, prompt shipment from the West, at 3.30¢ delivered here, in the face of an offer of one car at 3.25¢ in an inconvenient warehouse.

**Spelter.**—Offers have been made of good brands of common Western at 3.40¢ for delivery during the next three or four months. Single carloads or larger lots would be parted with providing at least one car is taken each month. This comparatively low price has failed to stimulate buying interest, however, and the market remains dull as well as weak.

**Antimony.**—Beyond ordinary jobbing business there is little doing, yet enough to keep prices quite steady. Quotations are 10¢ @ 10½¢ for Cookson's, 8½¢ @ 8¾¢ for Hallett's, and 9½¢ @ 9¾¢ for L X on the spot.

**Nickel.**—About 45¢ @ 50¢ is quoted for fair sized lots.

**Tin Plate.**—The conditions have not changed. Business is still irregular, being good one day and flat the next, while the general policy is to proceed cautiously with both spot purchases and orders for forward shipment. In prices the changes have been few and unimportant. The following is quoted for spot stock: Charcoal: Melyn grade, IC, \$6 25; do., Melyn grade, Crosses, \$7.75; do., Allaway grade, IC, \$5 40; do., Allaway grade, Crosses, \$6 45; do., Grange grade, IC, \$5.50; do., Grange grade, Crosses, \$6 60; do., Terne, M.F., 14 x 20, \$7.25; do., M.F., 20 x 28, \$14.50; do., Worcester, 14 x 20, \$5 70; do., 20 x 28, \$11; Alvin grade, 14 x 30, \$5.20; do., 20 x 28, \$10 @ \$10 25; D. R. D. grade, 14 x 20, \$4 90; do., 20 x 28, \$9.70. IC Coke: Penlan grade, \$5; do., J. B. grade, 14 x 20, full weight, \$5.15; do., 100 lb \$4.75; do., 95 lb, \$4 62½; do., 90 lb, \$4.55. IC Bessemer Steel, Coke finish: 14 x 20, full weight, \$5 15; do., 100 lb \$4.70 @ \$4 75; do., 95 lb, \$4 60; do., 90 lb, \$4.50. IC Bessemer Steel, Coke finish, sq., \$5 35. IC Siemens Steel, Coke finish, sq., \$5.45. Wasters: S. T. P. grade, 14 x 20, \$4.60; do., S. T. P. grade, 20 x 28, \$9; do., Albearne grade, 14 x 20, \$9.

## Financial.

Cold and unseasonable weather, floods, and the prolongation of the coal strike, combined with the continuance of uncertainty regarding tariff legislation, have served to still further depress business during the week under review. The leading feature of the financial situation is its dullness. Yet the outlook is, perhaps, more hopeful. The fact that the strikers are beginning to resort to riot and violence, and that the military forces of the State have been called out in several districts, in order to suppress the disorders, gives ground for the belief that a crisis in the matter has arrived, and the prospective settlement of the strike is generally looked for. Meanwhile, as a result of the coal scarcity, more mills have been shut down, and production in certain lines of manufacture is again becoming very restricted. Stocks of goods are still further reduced, and when the revival in demand comes there is a good prospect of abundant activity in the industrial world.

The discussion of the tariff bill still drags its slow length along in the Senate. Yet there are signs of an access of

activity in this respect and predictions are becoming more common as to the favorable prospects of its passage before the close of this month. To the settlement of the tariff and labor questions, all eyes in the financial and industrial world are at present looking with hope and desire. With these barriers to confidence out of the way, it is very generally believed that every augury points to a brisk revival of trade and an industrial recovery which will bring back prosperity to the business of the country.

Meanwhile the condition of the Treasury is beginning to excite some apprehension, and there is considerably more talk of the approaching necessity for a fresh bond issue. The gold balance, owing to the recent heavy exports of the metal, has fallen to about \$75,000,000. The monthly financial statement, issued on June 1, showed that the Government ran behind in May \$6,000,000. This was about the amount of loss of revenue from customs duties. For 11 months of the fiscal year the decrease in customs receipts has amounted to \$66,000,000, and the excess of expenditures over receipts has been about \$71,000,000. The receipts of gold by the Treasury continue to be small, the entire amount received at the New York Custom House during May having been only about 2½% of the receipts, or \$114 043, against 81% in silver certificates. With the constant drain on the Treasury reserve for gold exports, the balance will within a very short time fall to a lower point than when the call for bonds was issued in January. Under these circumstances it is difficult to see how the gold reserve can be rehabilitated, unless by a new issue of bonds. Last week's shipments of gold to Europe amounted to \$5,000,000, and, so far, \$1,400,000 has gone abroad this week. Bankers' profits on these transactions have of late been so slim, however, owing to greater weakness in foreign exchange, that they do not look for very heavy shipments during the remainder of the week. The great European banks are now so well supplied that they are not offering inducements to draw gold from this side. Money is as badly congested in London as it is in New York. The Bank of England holds at present the enormous reserve of \$180,000,000 in gold, and capitalists find it impossible to lend their surplus funds there. All this points to the probability of a large buying movement of investment securities when the present tariff disturbance is at an end.

Receipts of currency from the interior continue large and nearly offset the outflow of gold. Saturday's bank statement showed an increase of \$363,400 in the surplus of reserve held above legal requirements, the surplus now standing at \$77,165,100, against \$21,000,000 in 1893 and \$23,790,000 in 1892. Loans contracted \$1,783,300 and deposits decreased over \$2,000,000. The loan market has been dull and easy. Call money is still freely offered at 1%. Time loans are in abundant supply, but the stagnation of business has caused a contraction in the demand, especially for short time loans. Rates are 1% for 30 days, 1½% for 60 days, 2% for 90 days, 2½% for four months, 3% for longer periods. Mercantile paper is in excellent demand, so far as high grade names are concerned, but the supply of this material is very meager. Consequently the market is dull. Rates are quoted at 2½% @ 3% for best indorsed bills at 60 and 90 days; 3% @ 3½% for prime long commission house paper, and 3½% @ 4% for prime

and 4½% @ 6% for good single name notes.

For the greater part of the past week speculation on the Stock Exchange has been almost at a standstill, and except for the manipulation by the sugar pool of their specialty, the business done up to Monday last was absolutely insignificant. Beyond Sugar, Chicago Gas and St. Paul were the only noticeable features. Both these stocks scored advances toward the close of last week. The unexpected good showing of St. Paul for the fourth week of May, comparing as it did favorably with the corresponding week of 1893, caused a strength in that stock which was communicated to the other granger issues. It is taken as certain that St. Paul will earn and pay its full 4% dividend, besides carrying over a surplus of about \$250,000.

The strength of the grangers and the more healthy tone that has developed in the whole list of railroad issues, notwithstanding continued poor reports of net earnings, can be attributed to two encouraging incidents of the past week—namely, the decision of the federal Supreme Court that the railway commissioners of a State cannot fix rates so low as to preclude a reasonable profit on the cost of the property; and, secondly, the report of the House Commerce Committee in favor of amending the Interstate Commerce law so as to permit railways to pool their earnings under certain restrictions.

Tuesday on the Stock Exchange was marked by tremendous activity in sugar stocks, the pool forcing prices up and down, and 117,000 shares changing hands, on the strength of voting in the Senate on the sugar schedule of the tariff bill. Otherwise but little business was done, railroad stocks closing dull but strong. The extreme fluctuations of the principal active stocks during the week are shown in the following list:

	High- est	Low- est	Closing June 7
Am. Sugar Ref.....	106½	99½	107½
Atchison, T. & S. Fé....	8½	7½	8¼
Chicago Gas.....	75½	78½	75¼
Chic., B. & Q.....	78½	76½	79
Chic., Mil. & St. Paul...	60½	58½	60½
Distilling & Cattle Fdg..	25½	23½	25½
Gen. Electric.....	36½	34½	36½
Louisville & Nashville...	45½	43½	46
Manhattan.....	118	116	117
Missouri Pacific.....	28	26½	28½
National Lead, Common.	40½	37½	40
New Jersey Central.....	106½	104	106½
Northern Pacific, Pfd..	15½	14½	16½
Philadelphia & Reading..	17½	16½	17½
Tennessee Coal & Iron...	18½	17½	18½
Union Pacific.....	16½	15	16
Western Union.....	84½	83½	84½

Railroad and miscellaneous bonds have been relatively more active than stocks, and most issues are higher than last week. The movement of prices has been, however, irregular. Government bonds have also been active and steady. The closing quotations on Wednesday were as follows:

	Bid.	Asked.
2's, 1891, registered.....	96	....
4's, registered.....	112½	113
4's, coupon.....	114½	114½
5's, registered.....	117½	118
5's, coupon.....	117½	118

The advance obtained for Bessemer pig for forward delivery has already had the effect of encouraging preparations to start outside furnaces. We understand that Cleveland parties have leased the River Furnace at Cleveland and the Hall Furnace in the Shenango Valley.

Robert M. Thompson of the Orford Copper Company sails for Europe this week.

## British Metal Market.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, June 6, 1894.

Pig Tin prices have been irregular, finally falling to £70. 17/6 for prompts, making a decline of £1 5/ for the week. The fall was due chiefly to ready selling by importers and dealers in the face of more speculative buying. Toward the close there was some improvement in sympathy with silver. Continent advices are easier, but last Thursday Banca realized equal to £74. 15/. Straits shipments during the month were 3750 tons. Stocks in London decreased 925 tons, but this was balanced by increase of about the same quantity in Holland, where a large "bull" speculative holding exists. Wednesday the market was firmer, with prompts at £71. 5/, and three months' futures at £71. 15/.

Copper has been neglected and the price for Merchant Bar prompts declined about 7/8 on American sales, realizations by tired London holders and uncertainty as to the policy of the American producers. A report that large sales of Lake Ingot have been made in the United States at very low prices also had an unfavorable bearing. Consumers are quiet, their transactions limited. Chili charters last fortnight were 1400 tons. Stocks in Europe increased 621 tons, and the visible supply 1332 tons. Furnace material is scarce. At the close the market was quiet but firmer. Merchant Bars were quoted at £39 for prompts, £39. 7/6 for three months' futures and Best Selected English at £42.

Tin Plate market is firmer. There is more inquiry for forward deliveries, but sellers are asking a large premium and that checks business. Prompt shipments are in poor request, however, with Bessemer Cokes at 10/. Terns are stiffer on better demand. Swansea quotations are as follows:

Bessemer Cokes, 14 x 20.....	10/	@ 10/1 1/2
Siemens Cokes, 14 x 20.....	10/4 1/2	@ 10/6
Terns, double box.....	18/6	@
Charcoals.....	13/	@ 15/

Black Plate continues in active demand, and a large business has been done at £8 for Siemens, f.o.b. Wales.

Pig Lead has had a slow market, and the price has varied scarcely any from £9. 2/6 for Soft Spanish.

Spelter in limited demand, with prices easy at £15. 12/6 @ £15. 15/ for ordinary Silesian.

The Pontymister and the Llwydarth Tin Plate Works are restarting.

**The Latest Lackawanna Record.**—The Lackawanna Iron & Steel Company of Scranton, Pa., have beaten their own best record by their performances in May. We have already alluded to the product of several weeks. At the South Mills, during the month of May, the Bessemer plant made in 50 turns 23,875 tons of ingots, or an average of 477 1/2 tons per turn. During the month

the rail mill produced 20,583 gross tons of steel rails, and shipped 19,780 gross tons of rails.

## Pittsburgh.

(By Telegraph.)

June 6, 1894.

The regular monthly meeting of the Iron and Steel Sheet Manufacturers' Association was held in Pittsburgh on Tuesday. The attendance was large, about 20 concerns being represented in person. After the disposal of routine business the wage scale governing sheet mills for the year beginning July 1 was taken up. After a thorough discussion the matter was left in the hands of the Executive Committee with full power to act. A reduction in wages will be asked by the sheet manufacturers amounting to probably 10 per cent. and it is not improbable that a conflict will take place. A meeting of this Executive Committee and the Sheet Wage Committee of the Amalgamated Association will be held in few days. The regular annual meeting of the Tinned Plate Manufacturers' Association of the United States is in session in Pittsburgh to day. Wages governing tin house labor will come up for discussion, and it is probable a committee will be appointed to confer with the Amalgamated Association. A scale of wages for tin house labor has been submitted to the tin plate manufacturers by the Amalgamated Association, with request that uniform rates shall exist in the different mills. This scale may be considered, but it is certain to be rejected. At present each tin plate manufacturer fixes his own scale with his employees, there being no recognized scale for this class of labor. Rioting took place at the plant of the National Tube Works Company, McKeesport, yesterday. A number of employees were injured, but none were killed. The concern have notified their employees that those who do not report for duty on Thursday morning of this week will be discharged. An attempt will be made to put the plant in operation within a day or two, as there are a large number of men who wish to return to work.

R. D. Jones died on May 31, at McKeesport, Pa., after a long illness from kidney trouble, at the age of 64. He was born in Montgomeryshire, North Wales, and came to this country in 1856. From that time until incapacitated by infirmity Mr. Jones was identified with the management of various iron mills in Pittsburgh and its vicinity. He was one of the original stockholders of the United States Iron & Tin Plate Company of Demmler, Pa. Mr. Jones had served on the City Council of Pittsburgh and was on the School Board of the city, besides acting as Justice of the Peace at McKeesport.

A dispatch from Philadelphia announces that the creditors of the Maryland and Pennsylvania steel companies have practically reached an agreement for a submission of a plan to the stockholders by which adjustment of the company's affairs may be effected. It is the ultimatum of the creditors. There are two plans. One is to pay creditors 40 per cent. cash, 60 per cent. in bonds and 15 per cent. in stock or scrip. The other plan provides for foreclosure, in event of which creditors agree to in-

crease the capital \$1,500,000 by issuing preferred stock.

The annual meeting of the William Cramp & Sons Ship and Engine Building Company was held at the offices of the concern in Philadelphia, on May 31, when the annual report was read. From a financial standpoint the business done during the year was, it was announced, the greatest in the history of the company. The following were elected directors, to serve for the ensuing year: Charles H. Cramp, Thomas Dolan, Clement A. Griscom, Benjamin Brewster, William M. Cramp, Samuel H. Cramp, Jacob C. Cramp, Henry Seligman and Henry W. Cramp. The new board at once organized by electing Charles H. Cramp president, Benjamin Brewster of New York vice-president and Henry W. Cramp treasurer and secretary.

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# HARDWARE.

## Condition of Trade.

**C**CAREFULLY assorted orders for small quantities of goods have characterized the trade for the past month, though the opinion is generally expressed that the volume of business for May compares favorably with the preceding months of the year. The market on Wire Nails shows considerable strength at the recent advance in price, though there is a disposition on the part of buyers to purchase only for immediate requirements in anticipation of lower prices. The unfavorable weather for the past two weeks has added to the sluggishness of trade, diminishing the demand for such seasonable goods as Lawn Mowers, Freezers, Hose, &c., while restricted building operations limit the demand for Builders' Hardware. There is, however, every reason to expect a continuance of the present volume of business, except perhaps such a falling off as may naturally be attributed to the ordinary dull summer months upon which the trade is about entering.

### Chicago.

(By Telegraph.)

Shelf Hardware jobbers are enjoying a somewhat better trade than had been expected after the advance in Western freight rates last week. Orders have kept up from the various parts of their territory in good shape. They are not large, but fairly numerous, and the influx is steady. Very little buying is being done for stocking up, but the demand seems to be continuous for assorting. Even the trade in seasonable goods continues along in about the same way with a regular demand for small lots, showing that the trade is being kept well in hand and that the future has not been anticipated to any extent. For this reason jobbers are inclined now to believe that trade may continue steady for another month at least. A disposition is noted in some directions to increase orders for staple goods, probably owing to the strength of raw materials, which is perceived by all who are in touch with the iron trade. Wire Cloth is firm at \$1.60, with an unusual demand recently for large quantities from unexpected sources. House Furnishing Goods and Tinware are dull and are expected to continue so until workmen are better employed. Roofing Plates are scarce and firm. Heavy Hardware jobbers have had

much better trade during the past two weeks, which is largely in consequence of the closing down of so many mills, thus throwing business into jobbers' hands which usually goes to the manufacturers. This is a trade which is liable to be cut off soon by resumption of mills, but in the present uncertain condition of labor troubles may last for some weeks.

### St. Louis.

(By Telegraph.)

The demand for shelf goods keeps up to the average. The total business for the month of May is in fair comparison with the same month of last year. The increased trade for the period just mentioned was largely brought about by the low freight rates which prevailed during nearly the entire month. While the cut in freight rates increased the volume of business, it is doubtful if it is to the jobbers' advantage for these cuts to take place. Retailers anticipate their wants from two to three months, but unfortunately when the payments for the bills come due, are often unable to meet them. Nearly all merchants deprecate the cutting of freight rates, but notwithstanding this it will occur. Prices in nearly all lines are firmer, while in some they are notably higher. Black Sheets and Galvanized Iron are almost impossible to obtain, and prices have been sharply advanced. Wire Nails and plain Wires are also held very firm. Steel goods show the effect of the recent advance in raw material, and as it is largely due to the coal strike that these prices have advanced a continuation of the strike naturally means still higher prices.

### Louisville.

W. B. BELKNAP & Co.—Business still continues halting and unsatisfactory. The effort to boost up prices to any great extent on the coal and coke strike, &c., has not been over-successful. There is undoubted scarcity, but poor demand. An advance has been established in Wire and Wire Nails, and in Cut Nails and Bar Iron, but the situation is not exciting yet. In ordinary times, we should have seen long before this a very considerable appreciation in values.

Just at present we are all being admonished by the rolling mills to stock up before the adjustment of labor matters, July 1. Of course, if we all have that foresight which leads us to lay in plenty of stock there will be no scarcity later on, when we should hope to realize.

Almost all corporations that make exhibits are showing considerable losses in gross earnings. But there is also a decrease in expenses everywhere, so that the net results are not altogether depressing.

We are learning to adapt ourselves to present conditions. If these improve at any time in the future each one may be trusted to take care of himself, but the idea which prevailed in the early part of the panic that we could immediately regain the lost ground has been pretty effectually dismissed.

### Cleveland.

THE W. BINGHAM COMPANY.—Business for May has shown quite an improvement over April, but it is not up to the standard. Orders, while they are numerous, are very light, and of the hand to mouth sort. Season goods are in good demand, Lawn Mowers particularly. Wire Screen Cloth is hard to get, and the price has advanced to 1½ cents. The coal strike has given the price on Wire and Nails an upward tendency, and they will without doubt go higher if there is not soon a settlement of the differences between the miners and operators. Other lines have still an unsettled appearance. The outlook for summer business is not particularly bright, and we look for only a fair trade, but think it will surely be an improvement over last year. Collections are very fair.

### New Orleans

A. BALDWIN & Co.—Very quiet in all lines. Even seasonable goods feel the stagnation. A light stiffening in price of Wire and Nails seems to have killed off whatever trade in this line we anticipated.

Every one seems to have concluded to stop buying at the same time. Orders are few and far between. All are awaiting developments. We do not look for any improvement for some time.

### San Francisco.

MILLER, SLOSS & SCOTT.—We have always considered that after the end of April our rainy season is over, and that we shall have no further rainfall until some time in September. This year seems to have been an exception, and while we have had little rain in the spring when we usually expect it, and our growing crops really need it, we have had rainfalls nearly a month later than usual, and at a time when they have done little good and would have done considerable harm if they had extended over a larger territory. The rain of the past week though doing some benefit to fruit has done more damage to hay. On the whole, prospects for a good crop have not increased, and as long as this fact remains we cannot look for any considerable increase in the volume of business.

We find the country merchant buying only what he needs from day to day, so that though orders are frequent quantities are small, but the total volume compares favorably with previous years.

Business in mining supplies has fallen off considerably, but we notice a little flurry in the mining stock market, due to a reported find of rich ore in the Comstock mines. If this be true, and of any considerable extent, it is apt to increase business in this direction.

Collections continue up to previous

years at this season, and we think should continue so as long as merchants are buying in the quantities they have since the beginning of the year.

#### Baltimore.

CARLIN & FULTON.—In ordinary times the month of June is generally one of the duller of the year and contrasts very forcibly with the activity of the spring season preceding it, but this year the sales of the present month must be emphatically bad to show any marked difference between it and the months just past, but as we are now approaching the anniversary of the beginning of the terrible stringency of last summer all comparisons of sales for at least a year from now on will be made with months in which the sales have been the poorest ever known to the Hardware or any other business. It seems as though the elements themselves in the snows, the frosts and the floods of the past few weeks have conspired with man himself in the depression of business.

One does not need to be much of a pessimist to believe that with the unsettled state of labor, the gigantic strikes which are now prevailing, the enforced idleness resulting therefrom, the reduced earnings of not merely the strikers, but of also those in other lines, the decreased railroad earnings, the tendency to lawlessness and violence, the delay and criminal negligence in national legislation, with the charges of fraud in the highest legislative body in the land, with the farmer depressed through the depreciation of his wheat and corn and cotton to prices which do not pay for the cost of the fertilizers used, with the manufacturer harassed through the uncertainty as to what his materials will cost him and the jobber waiting with an expense account which never stops, this country has mighty problems to solve. And yet the cloud is not so black but that there is a silver lining, for we are promised as regards the tariff that the promised land is in sight, and though that long looked for country may not be as full of milk and honey as we all would wish, it is some consolation to think that the journey is nearly ended.

The scarcity of coal has given in some of the staples which had been reduced below the cost of production an opportunity and an excuse for advancing prices to probably remunerative figures, and it may be many days or months before we again see Nails and Wire return to the low prices of a month ago.

There has not only been an immense decrease of purchases, but also a proportionate diminution of manufacture, while there is every day an undoubted and necessary consumption of goods, and the time must come, and it may come very suddenly, that the trade will realize the fact that goods are needed in every quarter and every kind, and the demand far greater than the supply. The conditions are very different from a year ago. Money, which could not be had then at fabulous rates of interest, is now a drug in the market.

The depreciation of the currency with which we were then threatened has been stopped, mercantile failures are largely decreased, and the mercantile community owes less than at any other time in its experience; and with stocks depleted and the necessity for increasing them, there are many reasons for a resumption of business and an era of better times. Many houses are taking advantage of the dullness of the present month to take inventory of

stock, making the fiscal year end July 1, and few salesmen will travel until after that date.

We expect but little business for some weeks yet, depending mostly upon voluntary orders, which, though, of course, not aggregating in dollars and cents as much as we would like, yet are fairly numerous.

#### Omaha.

LEE CLARKE-ANDRESEN HARDWARE COMPANY.—The local situation as regards the jobbing Hardware trade has not been very productive of new or interesting features. Business has moved along very smoothly and in a fairly satisfactory manner.

As a general thing the movement of goods in seasonable lines is about all that could reasonably be expected under the circumstances.

The announcement that railroad freight rates would be restored from the recent cut was received with satisfaction by the jobbing trade, as a disturbing factor in trade will be removed. It is a fact, however, that the cut in freight rates has not had much effect on business, either one way or the other. In some lines it has been possible for jobbers to put in stocks at the low rates, but as the opportunity was open to all alike, it cannot be said that the cut was of any special benefit.

Much needed and welcome rains have visited the towns west of us during the past week, which has proven of incalculable value to the farming community, and put a much brighter outlook to growing crops, which were seriously threatened by lack of moisture.

#### Philadelphia.

SUPPLER HARDWARE COMPANY.—Trade during the interim since our last letter has been only of moderate volume, and largely confined to actual and immediate wants of the buyer. What orders have been placed show evidence of having been given with ability to pay considered.

Collections have been regulated largely according to locations. In certain localities, which have suffered from conditions that have existed during the last 30 days, customers have naturally been slow in responding. Other locations have been fairly satisfactory as a rule, doubtless owing to the smallness of the bills and restricted credits of the interior merchants, who are trying to confine their sales to as nearly cash as possible. This, coupled with personal economy and careful expenditure in business expense accounts, has enabled merchants to cancel their maturing small obligations.

Discouraging features and conditions have certainly obstructed every turn of the road for the last 14 months, during which time more patient, enduring, self-sacrificing and uncomplaining proprietors of industrial enterprises and mercantile establishments have never been known. They have made vigorous efforts at every hopeful sign of business return, to be met only with disappointment. There have been no aggressive demonstrations on the part of these persons, and one would think they were patiently submitting to an unavoidable dry rot.

The same self sacrifice has not shown itself within the large body of wage earners, even those who are supported during the winter months of

enforced idleness by the same class of persons, who could ill afford to donate anything, crippled as they were by existing conditions during the winter. Some of these wage earners, at the first opportunity to procure work, have at once rebelled at wages which seemed necessary.

The present strike in the coal and coke regions is certainly very unfortunate. The workers in the coal field of Central Pennsylvania claim no large grievance, and what grievances they did claim could have been settled without any trouble had it not been for outside influence; the strike having been ordered to close all the bituminous coal mines of the country, naturally included the mines of Central Pennsylvania, although this section has competition in coal mines in regions where the strike had not penetrated.

Idleness, poverty, discontent and starvation naturally caused aggressive conditions, which have resulted in mob law, violence, bloodshed and loss of life to that extent that Governor Pattison of our State considered it expedient to call upon the collected mobs to disband under threat of calling out the State troops.

The result of this will most likely be that new men will open the coal fields and strikers be compelled to leave their homes in search of work in other localities.

Combined with these conditions, industrial establishments continue closed or working on partial time only. Coupled with this, storms and floods have devastated property through our State; logs and lumber have been let loose, causing the loss of many millions of property, which has added to the misfortunes of the last 14 months of waiting for the tariff tinkers at Washington.

There are but two classes of the population of the United States who have been benefited by the unfortunate conditions and experiments of the last 14 months. One is the wealthy, who always have been and must necessarily always be benefited by low prices. In their faces can be seen a smile of satisfaction. It is to their interest that the rate of wages be reduced, the price of goods be cheapened, and extravagance be produced at the lowest possible cost.

The other class is the clerical force who have, through the magnanimity of their employers, retained their positions and salaries. These, however, cannot long continue unless existing conditions improve.

One of the largest retail merchandise establishments in our city confirm this in their description of the present buyers, when one of them recently stated thus: "Economy in purchases and diminished purchases are shown in the proprietors of manufacturing and industrial establishments and the proprietors of mercantile houses and wage earners. Little diminution in trade, however, is shown in the purchases of the ultra wealthy, and comparatively little diminution from the families of the regular clerical employees."

This state of things cannot last long. Low prices, for which there has been great clamoring for the last few years, are always an unhealthy sign of the times. Low prices must produce low wages, no matter whether the goods are purchased in this country or abroad. If purchased in this country, it means the reduction of wages and the reduction of purchasing power. If produced abroad and imported into this country, it means enforced idleness of those who otherwise would have been employed in the production of the goods.

As time passes, uncertainties of the immediate future continue. Tariff settlement still appears remote and uncertain, and fears are entertained that

it may extend into the fall, which will certainly be ruinous to fall trade, as people do not have the heart to enter into production at this time.

In the mean time the Government gold reserve has once more within the last year receded to the small sum of \$75,000,000. Bankers are becoming uneasy, and were it not that there was a belief that another \$50,000,000 of Government bonds can be successfully negotiated, loaning money by our banks would be restricted, unless upon gilt edge security.

In the mean time our Government is "going on tick." Contracts have recently been given, conditioned with payment being made at the convenience of the Government to pay.

Men in the employment of the Government are being discharged, owing to the Government's inability to pay, and the Government is going behind at the rate of \$6,000,000 per month. No wonder there is an uneasy feeling on the part of those who have invested their all in business enterprises.

In the mean time there is no indication whatever that those who are sent to Washington to represent their constituents are familiar with the present wants of the country. If they are they are certainly totally indifferent to relief.

#### Boston.

**BIGELOW & DOWSE COMPANY.**—There has been no material change. Possibly a slight cloud indicates that New England is to experience the depression that has prevailed in other sections. The past week indicates a falling off in general trade, but the past month will show the usual volume. Prices are still ruling very low, but there is not the disposition now as there has been in the past to hurry these declines. They come fast enough to please the most ambitious. Notwithstanding the higher prices of Steel and the apparent necessity of an advance in Wire and Cut Nails the prices have changed but little. The fact is, dealers will not pay higher prices, and this will prevent any material advance. Manufacturers may combine to sell at higher prices, but until the trade concede that the time is ripe for such advance it will not be maintained. The demand for medium grade Bicycles was never better. To-day they have the call. It is a fact of daily report from dealers who have never before sold any but high grade machines that they must have a machine to sell from \$60 to \$75. The medium grade machines have been so greatly improved that even at the lower prices at which they are sold they are giving perfect satisfaction, and are fast crowding out the \$100 and \$125 machines.

The prospects are for a fair trade in June. With money easy remittances should be better.

### Notes on Prices.

**Wire Nails.**—The Wire Nail market still shows an upward tendency and continues strong at the advance noted last week of \$1 15 in car lots at mill. Owing to the higher price of raw material manufacturers show no disposition to shade these figures, although buyers are ordering in limited quantities to meet present requirements. Small lots from store in New York are held at \$1.25 to \$1.30.

*Chicago, by Telegraph.*—The advance in freight rates from the East on the 15th is mentioned by manufacturers as

an additional element of strength in the Wire Nail market, which will fortify the position they have taken for advanced prices in consequence of dearer raw material. Some large sales have recently been made to jobbers in the Northwest, but orders in this immediate vicinity have been comparatively small, as large stocks are still held here which are offered at prices a little below those made by manufacturers. Quotations on factory lots are still about \$1.20, Chicago, but manufacturers talk of advancing this week. Small lots from stock are selling at \$1.20 to \$1.25, and jobbers report an increasing inquiry from the retail trade.

**Cut Nails.**—There is no change in the condition of the Cut Nail market, while the same conditions which prevailed last week continue to strengthen prices. Quotations remain unchanged and only a fair demand is reported. Eastern mills are quoting 95 cents to \$1 for Nails delivered on dock in New York. Small lots from store are held at \$1.10 to \$1.15.

*Chicago, by Telegraph.*—Local manufacturers of Steel Cut Nails have had a good trade and report specifications coming in freely on orders they have booked. Prices on factory lots are continued at 90 to 95 cents on 55-cent average. Jobbers have had a somewhat lighter trade in Cut Nails recently, but quote prices at \$1.10 to \$1.15 from stock.

**Barb Wire.**—The demand for Barb Wire is only moderate, with no change in the condition of the market. Prices continue firm, the market being represented by the following quotations for Four-Point Galvanized, delivered at the points named: Pittsburgh, \$2.05 to \$2.15; Cleveland, \$2 10 to \$2.20; Cincinnati or Allentown, \$2.15 to \$2 25; Chicago or New York, \$2.20 to \$2 30.

*Chicago, by Telegraph.*—Manufacturers state that while shipments of Barb Wire are not so heavy as before the recent advance in freight rates to the West, yet they are keeping up better than had been expected. The advancing tendency in the price of Iron and Steel seems to be stimulating buyers to take in larger stocks of Barb Wire and for this reason trade continues in fair condition. Prices are very firm, in some cases an advance being asked, but for the present prices of Galvanized may be quoted at \$2.30 to \$2.35 in small lots, with 10 cents off for carloads.

**Ladder Skates.**—Specialty Mfg. Company, Titusville, Pa., are putting these goods on the market. A description of the Skates was given in our last issue. They are sold to the trade at 75 cents per pair.

**Chain.**—The Chain market continues without important change in its general features. The demand is referred to as small, but the manufacturers have avoided accumulating heavy stocks, so that the amount of Chain on hand at

present is unusually light. Prices have been somewhat unsettled and lower figures are named, but there is at present a disposition to refuse to make further concessions. Jobbers have, with very few exceptions, been buying from hand to mouth and their stocks are unusually light.

**Sash Chain Fixture.**—This article was described in a recent issue as put on the market by the Barnes Mfg. Company, Phoenix, N. Y. It is sold at 16 cents per set, eight pieces, enough for two-sash window, constituting a set, subject to a discount to the trade of 50 and 10 per cent.

**Boss Instantaneous Mending Cone.**—P. D. Murphy, Lockport, N. Y., is putting on the market this article, which was described in our last issue. The Cones are sold to the trade at the following net prices:

One box.....	\$0.25
One dozen boxes .....	2.00
Three dozen boxes .....	5.25
Six dozen boxes.....	9.00
One gross.....	15.00

**Glass.**—Little of interest has transpired during the past week in the Glass market, while the demand continues restricted. The rainy weather of the past two weeks has retarded building operations throughout the country, and has to a large extent affected the distribution of Glass. Prices, as a rule are well maintained, although under some conditions quotations have been shaded. The New York market is represented by quotations on American Window Glass of 85 per cent. discount for single and double strength Glass in car lots, and 80 and 20 per cent. discount in smaller quantities. Plate Glass is in fairly good demand, with prices firm at 70 and 5 per cent. discount.

### London Hardware Club.

SOME TIME SINCE reference was made in our columns to the proposed establishment of a club in London for the use of those connected with the Iron, Steel, Hardware and Metal trades. As yet no definite action has been taken toward the formation of such a club. There appears to be a hesitancy on the part of the most influential men engaged in these lines about becoming identified with the movement, and thus far little has apparently been accomplished. The London Ironmonger, in urging the formation of such a club, as a desirable adjunct to the trades, remarks:

The chief difficulty to be overcome is the initial inertness which is the ordinary characteristic of the average Britisher in relation to any matter of this kind. There is some little "jealousy," no doubt, as was mentioned by one of the gentlemen interviewed by our representative recently, but it ought not to be difficult to overcome that petty feeling, nor should it be very hard work to secure a list of several hundred gentlemen willing to "talk the matter over," to say the least.

The difficulty mentioned as being in the way of the consummation of the project has been conspicuously absent in the formation of similar clubs in this country, and the clubs which are in operation have been of great benefit to the Hardware, Iron and Metal trades in engendering feelings of fraternity, cementing friendships and overcoming trade abuses.

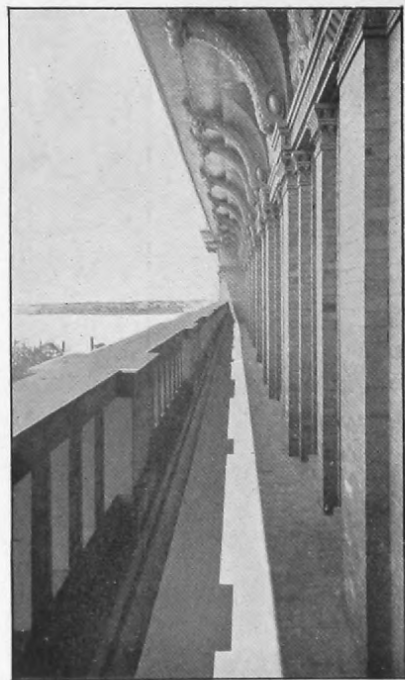




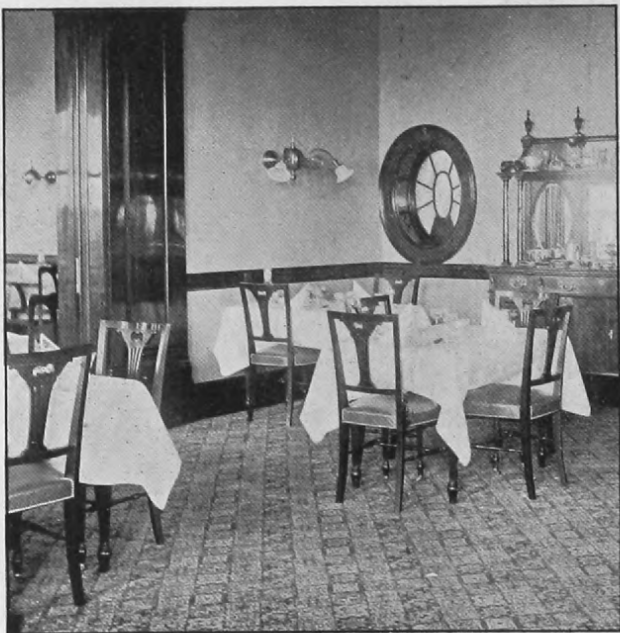
PRINTING HOUSE SQUARE AS SEEN FROM THE LIBRARY.



QUARTERS OF THE HARDWARE CLUB AS



BALCONY ON MURRAY STREET SIDE.



A CORNER OF THE LADIES' DINING ROOM.



GEN



RECEPTION ROOMS.



LOOKING DOWN THE H  
THE HARDWARE CL



SEEN FROM THE ROOF OF THE POST OFFICE.



VIEW FROM THE BALCONY.



GENERAL VIEW OF THE MAIN DINING ROOM.



IN THE LIBRARY.



HALL.  
CLUB OF NEW YORK.



THE KITCHEN.



## THE Hardware Club OF NEW YORK.

ON THURSDAY, May 31, the rooms of the Hardware Club of New York, occupying the fourteenth and fifteenth floors of the Postal Telegraph Cable Building, were opened for the inspection of members and their friends. We give herewith illustrations which indicate something of the arrangement of the rooms and their convenience and elegance, photographs being also presented of some of the views which are obtained from the windows of the club.

The opening of this club marks an epoch in the history of the Hardware trade in this city and throughout the country, there being already a number of members from far-off States, and the club occupying an influential position in this center of trade. The fact of its organization, even before the club came into active operation, has stimulated the formation of similar associations elsewhere, both here and abroad. The building in which the club has its home is exceptionally handsome and occupies an exceedingly desirable situation as a trade center. Facing, as they do, the City Hall park and having an unobstructed outlook of the rivers and the bay, the rooms of the club give unexcelled views of the city and suburbs, a feature which will doubtless be appreciated by the members and their friends and customers who may be the guests of the club.

The question as to the origin of the suggestion that a Hardware Club be organized is perhaps not an important one, but at the same time it is not without interest in view of the position of the club, and the growth and influence which it is expected will characterize its progress. There seems to be no doubt that William H. Williams, the president of the club, was the first to make the suggestion, which was done in the following words, which are an extract from the report given in *The Iron Age* of his speech at the Fourth Hardware Dinner, which was held at Sherry's, February 23, 1892:

And in this connection a fact suggested to me to-night is pertinent: That among those here gathered there is abundant material for the formation of a Hardware Club in New York City. In no association that any of us form outside of our daily walk in life do we find better material, more genial, manly, refined material, for the cultivation of business friendships than we have in our own noble Hardware trade; and I think if you men were to get together as soon as practicable after this dinner and resolve to form an organization down town, where you could meet once a day and have your lunch—resolve in the first place that you will have a lunch, and then that you will get together like sensible men, and have it in a decent, respectable manner, have a room where you can invite your customers from out of town, you could make as great a success of it as has been made by the Merchants' Club, the In-

surance Club, or any other similar organization in New York or in Philadelphia.

In this connection the following letter, which has been addressed by one of the governors of the club, who has been actively identified with its interests from the first, will be of interest as indicating the source of the suggestion of which Mr. Williams made such admirable use. This letter was addressed to some of the daily press, in which erroneous statements were published regarding the origin of the club:

*To the Editor:* Inasmuch as inaccurate and misleading reports have been published in the daily papers in regard to the circumstances under which the project for the formation of the Hardware Club originated, I have thought best to give you the facts in the case.

At the dinner of the Hardware and related trades, which was held at Sherry's, February 23, 1892, the proposition that a Hardware Club be organized was made by William H. Williams in his speech in response to one of the toasts. Prior to that occasion no suggestion had been made in regard to the desirability of an organization of the Hardware trade in this city, and Mr. Williams is thus entitled to the credit of first proposing it. The idea, however, originated with Brace Hayden, who just before Mr. Williams spoke went to the speakers' table and gave him the suggestion, which was received by the assemblage with much enthusiasm. The matter was then taken up by the trade, and after many delays the project has now been carried to completion in the organization and establishment of the Hardware Club.

A. G. SHERMAN,  
One of the governors.

June 2, 1894.

### THE OPENING.

About 2000 invitations to inspect the rooms had been issued, a large proportion of which were accepted. There appeared to be but one opinion among those who viewed the spacious and richly furnished apartments, and that was that the governors had acquitted themselves handsomely in the difficult task set them.

From 11 a.m. until 5 p.m. there was a constant stream of visitors, who were served with an elegant and bountiful luncheon prepared by the chef and his assistants on the premises. A number of the city officials, including the Mayor, who is a member, were present. Many ladies also graced the occasion with their presence.

### GREETINGS.

The congratulatory telegram given below was received and posted on the club bulletin board:

W. H. Williams, President New York Hardware Club.

The Southern Hardware Jobbers' Association extends to New York Hardware Club its warmest congratulations on its opening day and sincerely hopes that beneficial results may follow each succeeding day from the friendly conferences that may occur in your new home.

I extend to you and each member of your club an earnest invitation to attend our convention at Richmond, June 5, 6, 7.

A. D. LANGSTAFF, President.

The following greeting from the Hardware Merchants and Manufact-

urers' Association of Philadelphia was also received:

*Hardware Club of New York.*

GENTLEMEN: The Hardware Merchants and Manufacturers' Association of Philadelphia send greeting to your organization and hope that the auspicious event you this day celebrate may be the means of still further extending your usefulness, not only in your city, but throughout the entire country. Yours fraternally,

W. W. SUPPLEE,  
President.

T. JAMES FERNLEY,  
Secretary and Treasurer.

In a dining club the kitchen, preparing and serving rooms and table furnishings are of prime importance, and these appliances in the Hardware Club are of the latest and most approved character. The table leaves nothing to wish for, everything being constructed to order from selected designs. The Baccarat glassware, linen, Crown Hamilton silver, Haviland china, &c., are of exceptional elegance and all bear the club monogram.

The plan of having a collection of trade literature, embracing catalogues, &c., has met a gratifying response, some concerns having sent volumes specially bound in full Turkey morocco, Russia, &c., with gilded edges. The governors are anxious to secure as large a collection as possible, and all will be gladly received whether domestic or foreign. It may be well to bear in mind, if practicable, that books with stiff covers and titles on the back are most suitable for this purpose.

A copy of the constitution, by-laws and house rules in pamphlet form was sent by mail to every member on May 31. The following are the

### HOUSE RULES:

#### I.

The club rooms shall be open from 7 o'clock a.m. to 8 o'clock p.m., except on Sundays and legal holidays; but the rooms may be kept open on any legal holiday by direction of the Board of Governors, when due notice thereof shall be posted on the bulletin board.

#### II.

Any member may introduce a person for one day to all the privileges of the club. Members are not allowed to introduce the same person more than twice in any month.

Any member may introduce a person not doing business or residing within a radius of twenty-five miles of the city of New York for one week to all the privileges of the club, but can have no more than one such guest at a time; and no such person shall be introduced oftener than once in three months. A renewal of this introduction, however, for one week longer, may be granted upon a written application to the Board of Governors, who may then issue such extension.

Members have the privilege of introducing ladies to the ladies' dining room only.

Cards for the introduction of persons to the privileges of the club for one week shall be signed by a member of the House Committee, and all privileges thus extended shall be subject to withdrawal or cancellation by the Board of Governors.

The names and residences of all persons introduced, and the names of the members introducing them, must be

recorded in the books of the club kept for that purpose, and members shall be held responsible for their guests in all respects, including their indebtedness to the club.

## III.

On the first day of each month a bill of his indebtedness shall be sent to each member of the club, unless such indebtedness shall prior thereto amount to the sum of fifty dollars, in which case notice shall be immediately sent, as no indebtedness beyond this amount (except for annual dues or private dinners) shall be allowed.

On the fifteenth day of each month a list of members in arrears for the preceding month, together with the amount due, shall be posted in the club rooms, and such members shall be refused further credit until their indebtedness be discharged. A list likewise shall be posted at the same time of the members whose indebtedness then amounts to fifty dollars.

All notices to members shall be directed and mailed to the address given in the address book of the club, and all changes of address must be made in the handwriting of the member.

## IV.

Members wishing to give a private dinner must apply at the office and secure a room in advance, for which a charge of two dollars will be made. Bills for private dinners will be presented on the day following the entertainment, and shall be paid within five days.

Meals for less than four persons cannot be served in the private dining rooms.

## V.

No member or guest of the club shall give a fee or gratuity of any kind to any employee of the club.

An employee receiving a fee or gratuity of any kind from a member or guest shall be dismissed.

## VI.

Publications belonging to the club must not be taken from the rooms, nor cut, marked, nor otherwise defaced.

## VII.

All orders for articles served from the kitchen, wine room or elsewhere must be written and signed by the member ordering them.

## VIII.

No servant of the club shall be sent out of the club rooms by members for any purpose, but on application at the office messengers will be furnished at the regular messenger tariff.

## IX.

No subscription paper or petition, except in relation to the affairs of the club, shall be exhibited or circulated in the rooms of the club, nor shall any article be exposed for sale therein.

## X.

Damage done by a member to glass, crockery or other property of the club will be charged to him.

## XI.

A hat and coat room is provided for use of members, where checks will be given, and members are requested to avail themselves of this arrangement.

## XII.

No refreshments shall be sent out of the club rooms.

## XIII.

Smoking will not be permitted in the main dining room or ladies' dining room.

## XIV.

Payments can be made only at the office. Vouchers representing the ex-

act amount will be delivered to members at the time of payment.

## XV.

No wines or liquors shall be served except in the dining rooms and *café*.

## XVI.

No betting or games of any kind shall be allowed in the club rooms.

## XVII.

Rooms may be engaged by members for meetings, for which a charge of five dollars each shall be made.

## XVIII.

All requests and complaints must be made in writing, signed and addressed to the House Committee, and deposited in the box provided for the purpose.

## XIX.

The Steward is required to notify members of any violation by them of the Rules, and also to report any violations to the House Committee.

## OUR SUPPLEMENT.

We reproduce in the supplement herewith a number of views, both of the interior of the apartments of the club and of the surrounding territory, which will aid the reader in forming some conception of the conveniences and panoramic views afforded the members of the Hardware Club. The first engraving at the upper left hand corner is a view of Printing House Square, with the buildings of some of the leading dailies. Beginning at the New York terminus of the Brooklyn bridge may be seen the *World*, *Sun*, *Tribune* and *Times* structures, in the order named, with a portion of the City Hall on the left. Then comes an exterior of the upper portion of the Postal Telegraph-Cable Building, the top story of which is occupied by the club, as seen from the roof of the post office. The third picture is a bird's eye view of the harbor, looking west from the balcony on the Murray street side. Beginning at the left again is the long balcony protected by a parapet overlooking Murray street, which is  $4\frac{1}{2}$  feet wide and 123 feet long. The French windows, reaching to the floor of the main dining room, lead directly out to this, commanding a fine view of the Hudson and East rivers, Battery, harbor, islands and forts in the bay, Narrows and Atlantic Ocean. A corner of the ladies dining room is next seen. On the left are the large sliding doors communicating with the main dining room, both rooms being carpeted alike, so that when necessary they can be practically used as one room. The oval window opens directly into the office. Now we come to the large dining room, where the annual dinner of the club will probably be given. This room is 99 feet long and 27 feet wide. The trim is of hardwood, mahogany finish, as is the case with all of the rooms. The chairs are of solid mahogany. This view is taken from the west end, showing the entrance to the ladies' dining room beyond. We now come to the library, which is in the corner of the building resting on Broadway and Mur-

ray streets, the latticed window affording a view of lower Broadway. An artistic corner chimney piece was very appropriately added to its equipment at the last moment, and is likely to be a rendezvous when fires are needed. The furniture here is upholstered in figured velour. Here will be kept trade catalogues, files of leading trade and daily papers, and other literature of this character. At the upper left of this engraving is the club's escutcheon or coat-of-arms. We now come to the reception room at the Broadway end of the main hall, this room and the hall being of generous proportions and carpeted alike, the prevailing tint being Indian red. The final illustration of this floor is the stately main hall as seen from the reception room just described. On the left, in front, is the door leading into the telephone closet. Next is seen the entrance to the ladies' dining room. Then comes the office, with the oval windows commanding a view of the two dining rooms. Beyond is the entrance to the large dining room. At the end of the hall is the door leading into the passage to the elevators and to the *café*. On the right is the entrance to one of the two large committee rooms, having in the aggregate an area of about 850 square feet, the remaining room being entered either from the room at the end of the hall or the room just alluded to. These rooms will be used largely for trade and association meetings, price conferences, &c., and can be secured on proper application for a fee of \$5. The remaining picture shows a small portion of the kitchen in the separate structure on the roof, the ranges being seen in the distance. The walls of the main floor are all appropriately tinted and the entire apartments are lighted by electricity.

## NEW MEMBERS.

A meeting of the Board of Governors was held on Monday, June 4, when the following persons were elected to membership in the club:

ALLEN S. APGAR,  
Vice-president Merchants' Exchange National Bank,  
New York.

WILLIAM C. BIDDLE,  
168 Church street,  
New York.

EDGAR C. BRADLEY,  
Assistant General Manager Postal Telegraph Company,  
New York.

ANDREW S. BROWNELL,  
President American Real Estate Investment Union,  
New York.

GEORGE CLAPPERTON,  
Superintendent Commercial Cable Company, New York.

WM. W. COOK,  
253 Broadway, New York.

JULIAN W. CURTISS,  
Manager A. G. Spalding & Bro.,  
New York.

ETHAN ALLEN DOTY,  
70 Duane street, New York.

ASHBEL R. ELLIOTT,  
37 College place, New York.

EDWIN HAWLEY,  
Southern Pacific Company,  
New York.

WILLIAM HILLMAN,  
64 Reade street, New York.

W. J. JOHNSTON,  
Publisher *Electrical World*, New  
York.

IRVING G. LAWRENCE,  
79 Chambers street, New York.

EDWIN K. MARTIN,  
Vice-president American Real  
Estate Investment Union, New  
York.

F. W. PRENTICE,  
87 Chambers street, New York.

THADDEUS SMITH,  
107 Chambers street, New York.

A. G. SPALDING,  
A. G. Spalding & Bro., Chicago,  
Ill.

J. W. SPALDING,  
A. G. Spalding & Bro., New York.  
CHAS. S. UPTON,  
Rochester Lamp Company, New  
York.

WILLIAM F. WILSON,  
4 Warren street, New York.

It was on motion resolved to close the club rooms at 5 o'clock on all the Saturdays of June, July and August. An adjourned meeting of the club has been called for Thursday, June 14, at 1.30 p.m., for the purpose of electing five governors to succeed the following, whose terms of office will have expired: Eugene Bissell, Thomas F. Keating, J. H. Kennedy, J. L. Varick and R. R. Williams.

## SOUTHERN Hardware Jobbers' ASSOCIATION.

THE SOUTHERN HARDWARE JOBBERS' ASSOCIATION began its third annual convention at the Exchange, Richmond, Va., Tuesday, June 5, at 10 a.m. The assembly was called to order by Charles H. Watkins, chairman of the local Committee on Entertainment, who introduced Mayor J. T. Ellyson of Richmond. In his address the Mayor extended a hearty welcome to the members of the association and their guests, especially complimenting the ladies who graced the occasion with their presence. He was followed by A. D. Langstaff, president of the association, who, after pleasant introductory remarks, presented the following admirable address:

### Address of President.

I profoundly appreciate this manifestation in my behalf; its music has found a lodgment in my heart, and it will there echo and re-echo as long as I may live.

I want to extend to the gentleman who has just preceded me the thanks of the association for what he has said to us and for the welcome he has extended—not only for his assurance that we are welcome to-day but at any time we may hereafter come. It is a double welcome—a welcome for the present as well as for the future.

I will now proceed with the remarks that I have written in reference to this meeting.

The primary purpose for which this convention was called was to have a conference among its members relative to present business methods and to adopt such improvements as were possible and prudent. These subjects are:

Payment of salaries to traveling men.

Terms on which goods are sold.

Trade associations.

Credits and their applications.

Syndicate buyers.

The first four subjects form the very cornerstones upon which is built our modern business structure.

The preparation of reports on these subjects was assigned to the different members 40 days ago, and I have no doubt there will be presented interesting and exhaustive reports on each subject, to which your attention will be invited at subsequent meetings.

### MANUFACTURERS.

It was not contemplated until recently that manufacturers should be invited to this convention. In a circular letter addressed to the members of the association, I presented the question: "Shall I invite the manufacturers to the convention to have a friendly conference relative to regulating prices?" The responses came promptly, indicating that this question had been received with more intense interest than any suggestion I had made to be considered by this convention. From that day to this the members of this association have looked forward to this conference with manufacturers as of paramount importance, as it is from them we obtain the much larger portion of our merchandise.

I was apprehensive that the official invitations might not cause you to realize how anxious we were to have you here, and hence each member sent you a personal invitation. If you received more of these invitations than you deemed essential, we sincerely hope you will accept them as emphatic evidence of the kindly and earnest welcome we extend to you.

You have been advised that a sub-committee from the Manufacturers' General Committee had been appointed on your special line of goods.

When you received these invitations you no doubt asked yourself the questions: "Why do they want me, and what do they purpose doing?" That you had sufficient faith to justify your presence here to-day is a source of pleasure and satisfaction. You no doubt anticipated that this association, embracing nearly every jobber and customer you have in the Southern States, would, through these sub-committees, ask you to reduce your present non-dividend paying prices. As president of this association, I desire to disabuse your minds of any such intentions on our part and to affirm that our purpose is, by and with your aid and counsel, to improve the present methods of business.

The members of this association, individually and collectively, propose to stand like the Scots of old, shoulder to shoulder with each other and with you, in a determined effort to adopt such plans and methods in the distribution of your products through our hands as will obtain for the capital invested in your plants and in our business such reasonable profits as they are entitled to.

I congratulate the association that you have accepted our invitation to this friendly conference, and sincerely hope before we adjourn that you will have cause to reciprocate these congratulations.

It is worthy of note that there have been more trade associations organized in the past 12 months than in the same

number of preceding years. The question presents itself: "What has caused these organizations?" The peculiar conditions of trade, the increasing irregularities, the cutting of prices and consequent loss of profit, have all contributed to induce co-operation in the hope that by friendly conference between those in same lines of trade a remedy might be found to retard, if not prevent, this downward, destructive trend of business that has prevailed for the past three years. Giant trusts, with their long, strong arms, have embraced under one management factories whose capitals aggregate millions of dollars and the value of whose output is almost incalculable. Manufacturers of distinct lines of goods have formed combinations, to break which has been the proud boast of the jobbers' experienced buyer. Hardware associations and Hardware clubs have been and are being formed all over the land. Only yesterday was witnessed the formal opening of the palatial home of the New York Hardware Club. The travelers have formed and augmented the Travelers' Protective Association until its representatives may be found on every train, steamer and road of this great continent.

These trust combinations and manufacturers' conventions were organized to regulate prices. It had been the custom until the last two or three years that the manufacturers' conventions would be followed by sumptuous banquets. Later the less expensive dinner prevailed. Lastly, at most of them there has been an absence of either. Decreasing profits and dividends not earned account for these economic changes. The purposes of these Hardware clubs and associations have been to discuss business matters and to have social intercourse in connection therewith. The purpose of the Travelers' Protective Association is to protect the interests of employers and traveling salesmen and provide insurance benefits for heirs of the latter in case of death. The annual meetings are followed by banquets, in which each member tells in glowing, humorous language of the many carloads he sold and other minor victories won.

There have been conventions of manufacturers; there have been conventions of jobbers; there have been conventions of travelers—each acting independently of the other, although each was seeking to find the pathway that would lead to improved conditions in trade. It remained for the Southern Hardware Jobbers' Association, born in the mountain town of Knoxville only three years ago, by making a new departure, believing that "In union there is strength," to combine these three allies and have a convention composed of manufacturers, jobbers and travelers.

I earnestly believe and sincerely hope that the friendly conferences which are to obtain here to-day in this historic city, famed for many important conventions of past days, will by the united wisdom and experience of the parties in interest, be productive of such beneficial results to our business interests as to cause the question to be asked, "Why was this not done before?"

I am of the opinion that if the manufacturers had invited to their convention the salesman who brought to the attention of the jobber the product of the plants he would induce him to distribute, and the jobber who was to distribute them, and they thoroughly understood each other, and had combined these three links together, there would have been many less wrecks of broken combinations strewn along the pathways of commerce, carrying with them broken pledges and decreased confidence in the truthfulness of the members of the conven-

tion who had so recently formed these combinations.

The experience of the past years has taught manufacturer, jobber and traveler that it is almost impossible to maintain a combination. They have



*A. D. Langstaff*

been terminated in every instance by the jobber in his endeavor by judicious pressure upon the salesmen from one of the factories in the combination to obtain a special confidential 5 per cent. discount. He obtains the concession and signs a contract at this price. The satisfaction felt by this jobber in anticipating the additional profit he expects to make or the superior inducements he will be enabled to offer by giving away this special 5 per cent., was generally so short lived by the going to pieces of the combination and consequent lower prices than ever before, that this combination breaking jobber would sometimes find himself bound by a contract or loaded with goods bought at higher than those recently reduced prices.

Has the jobber gained anything by breaking these manufacturers' combinations? I will venture the assertion that he has lost more than he has made. The manufacturer has become so discouraged over these broken combinations that he hesitates to make others. May we not hope that by united action we may succeed in making agreements that may be the means of lifting our business from the present unprofitable and discouraging conditions to that higher level, when as the days pass by and the months come and go, we will have less annoyance and more pleasure in the transaction of business, and when the last day of the fiscal year shall have come, and the stock taking has been completed and our books balanced, there shall not be found wanting that result on the right side of your balance sheet that will bring back to your faces the golden smiles of satisfaction that may have been absent for many years.

The consumer must have manufactured goods; he cannot grow them on the plantation and he will not object to any agreement we may make here to-day to provide a reasonable profit, as without it the manufacturers must shut down and the merchant retire from business.

These conferences may occupy more time than you anticipate. I sincerely hope that while we all desire to complete the business that has called us here as quickly as possible, each and

all will be willing to remain and bestow on these important questions, the adjustment of which is vital to our business interests, the time and attention necessary for a proper consideration of them. The president of this association has devoted 60 days to the preparatory work of this convention, the secretary and members have devoted much time to the same cause. I propose to remain here as long as is essential, even if it takes all summer. We may not be able to accomplish to-day all we desire, but if we are true to ourselves and to the interests we represent we can begin the work, which if continued earnestly and intelligently will as certainly yield beneficial results as that the sun is shining in the heavens.

The Hoe manufacturers claim to have made no money for several years. I know the jobbers have made no profit on handled or eye Hoes for years. Are we to continue this unprofitable business?

How many manufacturers of handled Hoes are there in the United States, and for whom do they manufacture these Hoes? There are seven manufacturers, and they manufacture the Hoes almost entirely for the Southern jobbers. Can you tell me that the manufacturer is so wedded to his old method of ascertaining the cost of these goods, and then make that cost price his selling price, and that because of his past experience with combinations he may be unwilling to make another? Do you tell me that the jobber is so wedded to his profitless prices on these goods that he is unwilling to make an effort to abandon them? The presence of each of us here to-day, many of us having traveled hundreds and hundreds of miles from our far distant homes, verifies the statement that I now make, that our business interests are so envied by unsatisfactory conditions that we look to the councils that may here prevail to dispel some of these clouds and bring sunshine to us.

We have been told by the hopeful that these hard times will not last always; that there will be a change very soon for the better; that Congress will pass the Tariff bill and discontinue ill-legislating and go home and permit the business of the country to resume its normal condition. These hoped for changes may and will no doubt come, but I say to the members of this convention, so far as the Hardware interests are concerned, that the opportunity is here presented of not only hastening the coming of better times, but to take such action as will compel their arrival. Success in these days does not come to him who waits. The untiring energy, the intelligently directed effort, keeping everlastingly at it, is what brings success.

While we have not as members of this association the jobbers of our Northern sister cities, we are assured by them of their sympathy for and interest in the work we have undertaken.

It will undoubtedly be necessary, in order to make the work of this association completely effective, that we obtain their active co-operation. We are already assured by letters from jobbers all over the North, East and West of their sympathy in the work we have undertaken, and their promises of co-operation.

It will be of great service to the association in facilitating its work if you will kindly, before leaving this room, register in a book prepared for the purpose, at which time you will receive a ribbon of distinction and a programme.

There are many other matters of mutual interest that I might refer to, but other regular business now prevents.

The next speaker was Judge George L. Christian, president of the Richmond Chamber of Commerce, who cordially welcomed the assembly, laying especial stress on the fact that what he termed the young South needed most was manufacturing plants to develop its illimitable natural resources.

W. F. Rockwell, president of Miller Bros. Cutlery Company, then addressed the convention, by invitation, as a representative manufacturer, in a few felicitious remarks.

He was followed by the secretary of the Wholesale Grocers' Association of Richmond, on the absurdity of there being no differential between carload rates and less than carload rates. He hoped that the railroad and steamship companies could be prevailed on to grant an equitable differential between the two classes. He also referred to the necessity of charging for packages and drayage.

The gathering assembled as we go to press proves to be one of the most notable trade conventions ever held in this country. This is largely owing to the fact that not only are the Southern Hardware jobbers represented with scarcely an exception (some having more than one member present), but that a large attendance of manufacturers has been secured, comprising many of the leading and best known establishments in the trade. The extent to which the manufacturing interest is represented is shown by the following partial list:

#### Manufacturers Present.

Stanley Works, I. H. Pease, secretary.  
American Axe & Tool Company,  
Wm. T. Norton, secretary.  
Russell & Erwin Mfg Company, Wm.  
T. Smythe, S. B. Bispham.



*W. A. Churchill*

Nicholson File Company, Samuel M. Nicholson.  
Yale & Towne Mfg. Company, Alfred W. Clark.  
Washburn & Moen Mfg. Company, E. B. Powers.  
Hubbard & Co., John W. Hubbard.

Henry Disston & Sons, Samuel Disston.  
Sargent & Co., Frank Guildener.  
Peck, Stow & Wilcox Company,  
Chas. L. Campbell.  
Brittan, Graham & Mathes, Arthur  
Brittan.



Reading Hardware Company, J. C. McDonald.  
Fayette R. Plumb, B. R. Murray.  
Black Diamond File Works, Thos. Almgill.  
Landers, Frary & Clark, Chas. S. Landers, M. C. Nicholson.  
The Peters Cartridge Company, J. H. McKibben.  
P. & F. Corbin, Chas. H. Parsons, Geo. I. Haven.  
Withington & Cooley Mfg. Company, P. H. Withington.  
Kelly Axe Mfg. Company, James P. Kelly.  
Miller Lock Company, E. S. Jackson, secretary.  
Tredegar Company, J. T. Anderson.  
Richmond Lead Mfg. Company, John H. Lyons.  
Richmond Cedar Works, H. T. Miller, J. Scott Parrish.  
Maryland Bolt & Nut Company, Chas. R. Wilcox.  
Miller Bros. Cutlery Company, W. F. Rockwell, president.  
Marlin Fire Arms Company, Harry Marlin.  
Kilbourne & Jacobs Mfg. Company, F. W. Hubbard, secretary.  
Ausable Horse Nail Company, Abraham Bussing, president.  
The Brown, Hinman & Huntington Co., Henry S. Abbott.  
Maryland Tack Company, E. V. Cordell.  
Jewell Belting Company, Chas. E. Newton, Chas. L. Tolles.  
Keen & Hagerty, D. V. Hagerty, D. M. Walke.  
Consolidated Steel & Wire Company, T. B. Coles, K. M. Burton.  
Cincinnati Barbed Wire Fence Company, R. D. Carver.  
Alex. Speer & Sons, Jos. T. Speer, I. C. Kemohan.  
McCaffrey File Company, Hugh McCaffrey.  
Belfont Iron Works, S. G. Gilfillan.  
Crescent Horse Shoe & Iron Company, C. T. Kensil.  
Ellis & Lessig Steel & Iron Company, J. B. Lessig, Jr.  
Pennsylvania Drop Forging Company, Robert H. Hill.  
Baltimore Silver Plate Company, Robert H. Carr, Jr.

Trenton Rubber Company, Ed. H. Garcia.  
Harriman Hoe & Tool Company, Geo. B. Durell.  
Skillman Hardware Mfg. Company, E. V. D. Skillman.  
John C. Schmidt & Co., John C. Schmidt.  
E. C. Atkins & Co., W. H. Perkins.  
Whitehead Bros. Rubber Company, James M. Crisp.  
Wayne Agricultural Works, W. H. Smith.  
Chattanooga Plow Company, C. D. Mitchell.  
Western Hame Works, J. W. West.  
Towers & Sullivan Mfg. Company, A. R. Sullivan.  
J. A. De Armond Mfg. Company, J. A. De Armond.  
South Harrisburg Chain Works, Chas. D. Stucker.

#### Other Guests.

Among the prominent jobbing houses represented who are not members of the association we notice:

Hermann Boker & Co., Thos. Ellis.  
Wiebusch & Hilger, F. S. Seeley.  
John H. Graham & Co., W. A. Graham, T. H. Gasset.  
A. Baldwin & Co., A. Baldwin, Jr.  
Stauffer, Eshleman & Co., Major-Gen. B. F. Eshleman.  
Hy. Keidel & Co., Hy. Keidel.  
Wier & Wilson, Chas. H. Wier.  
Tabb-Jenkins Hardware Company, J. P. Tabb.  
Deveney, Hood & Co., E. W. Deveney.  
W. W. Crandall.

George Deming, vice-president and general manager of the Geo. Worthington Company, Cleveland, Ohio, attended as the guest of the association, representing the Cleveland Hardware Jobbers' Association, of which he is the president. This association is about eight years old, and is said to be among the most efficient of its kind in this country.

#### Reception Committee.

The Reception Committee proved themselves exceptionally efficient and did admirable work in introducing the members and their guests to each other, many of whom knew those present in an impersonal way through correspondence and trade connection, but had never met before. In making up this Senior Travelers' Reception Committee, of which Irby Bennett of the Winchester Repeating Arms Company was the capable chairman, it was impossible to do otherwise than leave out many well-known travelers with hosts of friends in the trade, the effort being to make the committee as diversified as possible. A number of well-known travelers were present besides those on the committee, and many kindly and pleasing expressions were used in referring to those who were absent.

The friendliness of the greeting bestowed by both manufacturers and jobbers indicated the confidence and esteem with which the traveling salesmen are regarded.

#### A Representative Gathering.

A pleasant feature of the convention is the fact that not only are the jobbing interests represented but that manufacturers are invited to confer with them, and also the traveling

salesman, by whom the two classes, the producers and the distributors of goods are brought together. In this respect the present gathering is a marked advance on any that have preceded it.

The cordial greetings exchanged are pleasant to report, and there is no doubt that good results will follow the conferences.

#### Private Session.

After the adjournment of the opening session the members of the association met to transact business in which the public were not specially interested. At this meeting the following report of William P. Smith, the efficient secretary, was submitted, and will be of interest as indicating the strength and progress of the association and the character of the work it is doing:

#### Secretary's Report.

Since we last met together, a little over 13 months ago, many changes have been wrought upon the trestle board of the commercial arena. A financial panic, probably the most severe that America has ever experienced, has swept over our fair land. Almost with the rapidity of the deadly cyclone it moved, leaving in its wake the blasted hopes of many a bright and glorious future.

Huge financial and commercial institutions which for decades had been the Gibraltar of a score of storms crumbled like the walls of the Eternal City before the conquering hosts of Babylon. Like the oak of the forest, the members of the Southern Hardware Jobbers' Association, save one, have withstood the mighty tempest, and while all our hearts go out in sympathy to the unfortunate members of the firm of Macon Hardware Company, yet we can but feel in looking backward for the past year that it is



miraculous that more did not go down in the fearful crash; and while we are yet in the wilderness we feel that we stand upon the banks of a Jordan and can see the green smiling fields of a Canaan beyond.

Since our last meeting we have admitted six new members; one has been reinstated, one has failed and one has withdrawn—leaving a clear gain of five, and a membership of 68. There are yet a few others in our territory who should become members of our association. Could we secure the new firms above referred to, our association would then comprise every jobber within the Southern territory outside of Texas.

The immense amount of work done in order to secure a uniform price on steel Plow Shapes for the past season and the signal failure to accomplish the desired result, particularly in some parts of our territory, have taught us that any effort to regulate prices by the whole association would be futile. I therefore think that the Committee on Trade Associations should use every effort to have local associations organized at all points in our association where same do not now exist. This should be done not so much for the purpose of regulating prices as for the correction of abuses between ourselves. Where only one or two members are in a city then I would suggest that they meet locally with their nearest competitive point; for example, I would suggest that Richmond, Petersburg and Norfolk form a local association. These local associations are productive of good results and take out of us a great amount of the keen edge of sharp competition so common among the Southern Hardware jobbers.

I also think that a great many goods which are manufactured by one firm, or at most by a few manufacturers, can be made pay a much better profit by calling the manufacturers to our aid. I feel sure that the Manufacturers' Committee has plans to submit which, if carried into effect, will be the means of not only strengthening our organization, but augmenting our profits as well.

Every one present will admit that while prices have gradually gone lower and profits have melted like frost before the bright May sunshine, the cost of doing business has held its own to a remarkable degree, and the dealer whose percentage of cost of doing business in proportion to his sales has not materially increased during the past three years should count himself exceedingly fortunate.

The custom of selling goods at a certain percentage over cost has ruled so long that any material increase in profits by advancing the gross percentage over cost will be hard to maintain; certainly our net profits cannot be augmented from this direction to the extent of offsetting our losses on general decline in stock on hand and the increased percentage of doing business. Then the very pertinent question is asked: "What are you going to do about it, or what is the remedy?"

If I am not greatly mistaken, we are here for the express purpose of a full, free and frank discussion of the situation, and to if possible devise ways and means by which the jobbing Hardware business will be lifted from its present unsatisfactory condition to a point where we can at least manage to get a new dollar out of an old one.

1. I would suggest that we meet the manufacturers whom we have invited here for conference as fellow sufferers, rather than our enemies. The jobber cannot live without the manufacturer, neither can the manufacturer very bountifully subsist without the jobber. They are as essential to each other as the elements of air and water are to life. Then why should they not be fast friends? Each has his place in the great race of life, and care should be taken that in making this race they do not necessarily be forced to cross bats on the field of the retail dealer.

The manufacturer can only sell a cer-

tain quantity of goods, and by confining his sales strictly to the jobber he saves not only the annoyance of the multiplicity of accounts which going to the retail and consumers' trade brings, and the consequent increase in bad debts, but the increased expense in marketing his product as well. He also places himself in direct competition with his best customer. Let us present the facts to our invited guests in a plain, businesslike manner, and I predict that they will not only give us a patient hearing but will meet us half way on any reasonable ground. This being accomplished we have gained one step in the direction of improvement.

2. I predict that it will be clearly shown by the report of committee on "Payment of Salaries to the Traveling Salesmen" that a jobber's worst enemy is his own traveling salesman.

If there is a firm represented here to-day who control their traveling men, rather than their traveling men controlling them, they are to be con-



*W. P. Smith.*

gratulated upon being the exception rather than the rule. The traveling man leaves home loaded with the latest prices, and instructions from his firm to make certain prices on certain goods and go no lower under any circumstances. Among the first installment of orders sent in by him is one of the articles sold considerably below his limit, with the explanation that "Mr. B. offered this price in order to get this man's trade, but as he is my customer he held the order for me, and of course under the circumstances I could not afford to pass it." What is the result. The order is filled without further investigation as to whether Mr. B. did make the price, or if he did so the causes impelling him, and instead of this being an exceptional cut, the salesman, with your sanction of silence, makes it his price for the trip. Other cases of similar nature might be given as illustrations, but I feel that it is unnecessary. They are so common to all present that they need no reference. Should we succeed in learning and adopting a means of controlling our traveling men, then we have scored a great victory and gained another point toward securing success.

The subjects, "Terms on which Goods are Sold," "Box and Drayage," "Goods Returned by Customers," "Who and Who Not to Credit," have all been carefully considered and thor-

oughly digested by their proper committees, and we ought certainly to profit greatly by the plans that will be presented, and which the majority will after careful consideration adopt.

As it requires practical unanimity to successfully operate any plan that may be adopted, let us weigh every question carefully and impartially. Let us lay aside personal prejudice and view every question from an impartial standpoint, and we will unquestionably reap the harvest of ultimate success.

As our edition of by-laws, which was printed soon after the organization of our association, is exhausted, and as some new legislation is necessary pertaining to honorary members and other subjects, I would suggest that the president be instructed to appoint a Committee on By-laws, with himself as chairman of said committee, with instructions to report a revised code of by-laws and rules of order to this meeting prior to adjournment.

I cannot close this report without referring to the immense amount of work done by our president. For the past two months he has labored both day and night to forward the success of this meeting, and if you will only reflect that he has no more personal interest than any other member and has given all this time and thought without compensation or promise of reward, all being so cheerfully given for the advancement of the interests of this association, I am sure the heartfelt thanks of every member will be given him.

I also desire to thank you all, each and every member, both present and absent, for the hearty co-operation I have received at your hands. Let us with one accord deliberate for our mutual good, and nothing but personal and permanent beneficent results can possibly accrue.

The president's report was as follows, and touches in forcible way upon the work of the association:

#### President's Report.

I am rejoiced to see so many members present. I know from recent correspondence with some of you that to enable you to leave home you had to make a considerable sacrifice. Stock taking, either in the first or last stages, seems to prevail all over the South, preventing many members from coming.

We are advised by letters from members of their regrets in thus being compelled to be absent and of their lively interest in whatever may be transacted and assurance of their co-operation. We must by additional energy and enthusiasm provide for them.

#### FOR THE INITIAL MEETING.

It is the universal custom that the president shall at the opening of meetings of this character make a report of the work done in the interim since last meeting and make suggestions relative to the work that may be brought before the convention.

I have already this morning at the reception meeting presented part of my report. I concluded 40 days ago to offer suggestions in ample time prior to this meeting, so that it would devolve on the members to make reports on various subjects. I have no doubt you come prepared.

In transacting the business preceding this meeting, I have often hesitated to do what I deemed essential in my desire to create that enthusiasm that must exist to insure the success of a movement of this kind.

This hesitation arose from a fear and sometimes a conviction that the suggestion I might present might not be appreciated, as you might have already

THE SOUTHERN AGL. WORKS  
S. L. Lanchester  
President

**Members of the Southern Hardware Jobbers' Association.**

done that which would cause you to look upon these suggestions as superfluous. In these debates with myself I lost sight of you personally in the question, and only asked "Can it benefit the association?" I have, from time to time, before taking action on the various ideas, submitted them to Messrs. Frederick Orgill, N. A. Gladding and Irby Bennett, my co-members in Memphis, and from them obtained suggestions and approval.

The encouraging letters received from you were a great relief to me. They satisfied my mind and stimulated me to renewed inquiry in endeavoring to find additional subjects to present for your consideration, and continued effort to make this meeting a credit to the Southern Hardware Jobbers' Association.

We have a very important work to do here, the vastness of which and its far reaching results cannot now be foreshadowed.

I have great confidence in your ability to transact this business intelligently and conservatively.

We must not be in haste to get through the business which we have come so many miles, some of us having come from the extreme opposite confines of this country, to transact.

We must not get discouraged if our hopes are only partially realized, but with patience and perseverance of the insect that after many, many efforts wove his web in the prisoner's cell, remember that we are far above the insect; that we are men breathing the very breath of God and gifted by Him with such ability and talents as hold us responsible for their proper use. Comprehend for one moment the strength of this association combined as a unit.

Having studied well the subjects upon which we desire to confer with the manufacturers we must present them for their consideration in the most friendly spirit, and with prudent and earnest statements, supported by evidence and by the united voice of this association.

There will be but one result. If our requests are reasonable, and we stand as one man, they will be granted.

I have arranged that the conferences of the sub-committees with manufacturers should occur as the first business. I will submit this proposition for your approval in a few moments. It is essential that each member should in concise and brief statement afford each sub-committee his views and wishes pertaining to the subject of which they have charge. To enable us to obtain this information rapidly and correctly, I have employed a stenographer, who will furnish each committee, by the time they meet this afternoon, with whatever information may be furnished by the members this morning. I have not assigned the secretary to any of the committees, nor have assumed any of the work pertaining to same, as I anticipated that our services would be employed in other general duties.

I make this special request of each of the members: That in whatever way it is possible to promote the interest of the association, it matters not how small the proposition or suggestion may be, I will be very glad to bring it before the association for consideration.

#### AFTERNOON SESSION.

In the afternoon session of Tuesday attention was given to the constitution of the committees to confer with manufacturers, which is an important part of the programme of the convention. There are a good many practices in the trade in regard to the prices and terms at which goods are sold, which will

receive careful consideration with the purpose of correcting existing abuses. It is hoped that some practical reforms may be brought about.

For the purpose of distinguishing the three classes present, handsome badges of silk ribbon, lettered in gold leaf, were provided. Those of the Reception Committee were red; for the members, white, and for the guests, blue.

The *Tradesman* of Chattanooga issued an official programme souvenir, with their compliments, which was artistically gotten up. This gave the list of officers and members, composition of committees, subjects for discussion, together with miniature portraits of association officials and many of the members.

The president of the association, A. D. Langstaff of Memphis, has proved himself the proper man for the place. It is very evident he has given much time and thought to the perfecting of the details, as necessary to achieve the best results. The devotion shown recalls another instance of efficiency during the terrible scourge of yellow fever in Memphis some years ago. Mr. Langstaff at the time the epidemic broke out was resting and recuperating at Coney Island, near New York, with friends, some of whom are present at this convention. He was urged not to sacrifice himself by returning, but despite the entreaties of his associates he hurried to Memphis and as the president of the Howard Association engineered and directed the operations of that famous society, facing death in one of its most horrible forms when the natives were dying by hundreds, remaining manfully at his post until the danger was past.

The association adjourned at the close of the afternoon session until Wednesday, the evening being devoted to recreation and conferences in regard to the relations between manufacturers and dealers. These conferences also occupied Wednesday forenoon, and the results of them will be brought before the convention at the afternoon session. It is intended also to devote the greater part of Thursday to reports of committees which relate to important practical questions, from the discussion of which it is hoped that many needed reforms will result.

Several excursions have been arranged for, but they will not occur until at least the greater part of the business of the association has been transacted. Our latest advices are to the effect that the work of the association is progressing very satisfactorily and that there are constant accessions to the number of manufacturers in attendance. The success of the convention seems to be assured, and it is certainly one of the most important gatherings of Hardware interests held for many years.

A full report of the subsequent proceedings of the association will appear in our next issue.

#### Portraits of Officers.

We take pleasure in giving herewith portraits of the officers of the association, as follows:

A. D. Langstaff, president.  
W. A. Chenoweth, first vice president.  
W. A. Gregg, second vice-president.  
W. P. Smith, secretary.  
J. C. Vance, treasurer.

We also give on another page fac-similes of the firm signatures of the different houses comprising the association.

## The Dempsey Cutlery Display Case.

THE UNION SHOW CASE COMPANY, 167 and 169 Randolph street, Chicago, Ill., are manufacturing and placing on the market the Dempsey Patent Cutlery Display Cases. These cases contain many features which are unique, novel and withal intensely practical, as shown in the accompanying cut. The design of

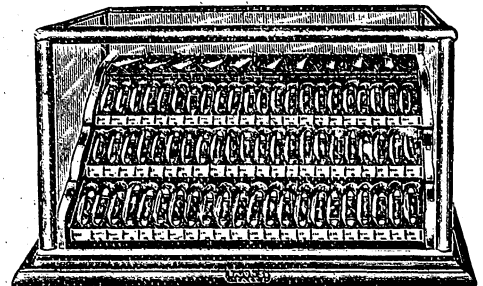


Fig. 1.—The Dempsey Cutlery Display Case.

the case, the inventor states, is to furnish the trade with a case that meets all requirements with no disadvantages. As seen in Fig. 1, Pocket Knives to be displayed are arranged in parallel corrugations at an angle of 30° and in three separate horizontal tiers rising one above the other. The larger patterns occupy the base or lower tier, while the smaller and more expensive

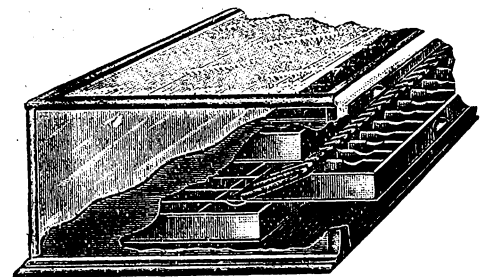


Fig. 2.—Sectional View of the Dempsey Case.

are placed in the second and third tiers. Rising above the third tier at an angle of 10° and running parallel with the lower tiers is a board for Razors, Shears or Scissors. The background is of blue, red, green or old gold plush. To add still further to the embellishments as well as conveniences, below

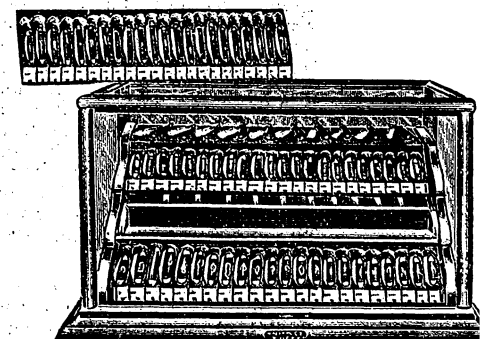


Fig. 3.—Detachable Display Boards.

each tier of patterns displayed and running horizontally is a strip of burnished and lacquered brass, perforated in such a manner as to hold tags on which are printed the number and price of the article immediately above.

These price tags are easily detached and can be quickly changed so as to meet all the conditions of the trade. By means of these tags the attention of the purchaser is called not only to an array of glittering blades and handles in a general way, but his attention is directed to individual and particular patterns. They also enable Cutlery to be easily marked without marring or soiling.

The internal construction of the case will be understood by reference to Fig. 2, which gives a sectional view. Each display tier has compartments for stock which are concealed from view in front, but can be drawn out in the rear like a drawer. By this arrangement the capacity of the case is exactly double that of an ordinary show case. A case 30 inches long carries the stock and displays 66 patterns of Pocket Knives and one dozen patterns of Razors, Shears or Scissors. The display boards, as seen on the front of the case in Fig. 1, are detachable and may be placed on top of the counter or show case, as shown in Fig. 3, for the closer inspection of the customer. When stock is low, by placing two or more of each kind of Knives on the display rack the stock can be made to appear to the purchaser to be quite large, while on the other hand if the stock is very large and the dealer is crowded for space it can be contracted by displaying only one of each pattern. Another feature of this case which recommends it to the trade is the fact that it is practically impossible for careless clerks to disarrange the display, or for it ever to appear otherwise than in the best possible condition. Although this case was only patented October 3, 1893, it has been adopted by leading jobbers of Cutlery throughout the entire country.

### Trade Items.

**I**N ACCORDANCE with the usual custom the Hardware trade of Boston will close their stores at 1 p.m. on Saturdays from June 16 to September 8, inclusive.

IN THEIR ADVERTISEMENT on another page, John H. Graham & Co., 113 Chambers street, New York, as general agents for the manufacturers, direct the attention of the trade to Bonnette's Arc Lawn Sprinkler, which will throw water in a complete circle or half circle, as desired. The advertisement also illustrates the Hustler Lawn Sprinkler, the quality and low price of which are emphasized.

THE *New England Magazine* for June, 1894, contains an article entitled "Rhode Island at the World's Fair," in which the exhibits made by leading Rhode Island concerns are dwelled upon. Among these, those of the American Screw Company of Providence are conspicuously mentioned. Descriptions are given of the company's three exhibits in the Manufactures Building, Machinery Hall and the Government Building, an illustration being also presented of the display in Machinery Hall, where the new cold forging process employed in the manufacture of Wood Screws, Drive Screws, Tire and Stove Bolts, &c., was exemplified.

FILSON BROS., Point Pleasant, W. Va., manufacturers of the Champion Shot Case, are offering the patent for sale or in exchange for a stock of Hardware. The case is made of oak, with a glass front, and is so arranged as to show each size of Shot by itself. It is divided into eight compartments, each compartment holding one bag, or 25 pounds of Shot. Each compartment has an adjustable tube attached to the bottom, made to adjust to  $\frac{1}{2}$  pound, from which a customer can be sup-

plied with any amount called for. Each tube can be adjusted by any pair of scales, and when once adjusted the Shot need not afterward be weighed.

MANUFACTURERS of Hardware Specialties desiring representation in Boston and vicinity will be interested in the card of "F" in the advertising columns this week. The advertiser is well acquainted with the trade and offers his services to introduce specialties on commission.

THE BENEDICT & BURNHAM MFG. COMPANY, 13 Murray street, New York, manufacturers of Brass and Copper goods, whose warehouse is within a few doors of the Postal Telegraph-Cable Building, have seized the opportunity presented them by the location of the Hardware Club in the upper part of that structure to have a large sign painted in white on the flat tin roof of their building, far below, calling attention to the goods they deal in. Members or visitors who are attracted to the west end of the large dining room or *café* by the fine view of the Hudson will hardly fail to see it.

ON MAY 28 Henry B. Newhall was appointed receiver of the Henry B. Newhall Company of New York by the Court in Chancery of New Jersey. A similar appointment was also made for New York by the United States Circuit Court of this city. We are advised this does not in any way involve Mr. Newhall's other interests, embracing the Newhall Ship Chandlery Company, New Jersey Foundry & Machine Company, and the Newhall & Phipps Company, recently organized. The latter company have transacted no business yet. The many friends of the H. B. Newhall Company will regret the embarrassment which has overtaken them, and hope for an early and favorable issue from their difficulties.

IN OUR ADVERTISING columns this week will be observed an announcement in regard to Razorine, a preparation intended for sharpening Razors without injury. This preparation will, it is claimed, sharpen the dulllest Razor, and is put on the market by the Razorine Mfg. Company, 2 West Fourteenth street, New York.

H. C. MARSHALL, syndicate buyer, formerly at 99 Chambers street, corner of Church, has moved to 107 Chambers street, taking half of the first loft, the balance of which has long been occupied by the Dunham, Carrigan & Hayden Company. He has added to his list the house of Richards & Conover Hardware Company, Kansas City, Mo., long and favorably known as one of the best jobbing houses on the Missouri River.

ON JUNE 1 Louis S. Coe retired from the firm of Edward P. Haff & Co. of this city, manufacturers of Hardware specialties, and will continue in the same business as president of a corporation styled Coe Mfg. Company, 98 Duane street, New York. This concern will manufacture a complete line of specialties in Cork Screws, Tape Measures, Tweezers, Key Chains, Hair Curlers, &c., as well as a large assortment of House Furnishing Hardware. Mr. Coe, who is well known to the Hardware and specialty trade in this city and vicinity, is preparing to bring out a number of useful and attractive articles for the fall trade.

THE POPE MFG. COMPANY have arranged to run a special limited train of Wagner vestibule cars from Boston to Denver and return, on the occasion of the bicycle league meet, which will be held in that city, August 13 to 18. We understand that the party will be limited to 100 persons, and that it is rapidly filling up. The excursion will be accompanied by Col. Pope and other officers of the company.

THE UNION NUT COMPANY, Unionville, Conn., and 107 Chambers street, New York, announce that having secured a special charter from the Connecticut Legislature they will hereafter conduct their business under the style of the Union Nut & Bolt Company.

### Price-Lists, Circulars, &c.

THE SAMUEL C. TATUM COMPANY, Cincinnati, Ohio: Mechanics' Tools, Hardware Specialties and Ice Cream Freezers. An illustrated 1894 catalogue and price-list, No. 13, shows a line of Clamps, Bit Gauge, Plug Cutter, Scrapers, Washer Cutters, Bit Wrench, Brace Socket, Wrenches, Shaves, Brackets, Harness Hooks, Samson Casters, Ohio Freezers, &c.

THE MECHANICAL RUBBER COMPANY, Cleveland, Ohio: Fire Hose. A catalogue devoted to this branch of their business illustrates with descriptions a large line of Fire Hose, Swinging Hose Rack, Play Pipes; also gives list prices of Nozzles, Hose Pipes, Nipples, Caps, Reducers, &c.

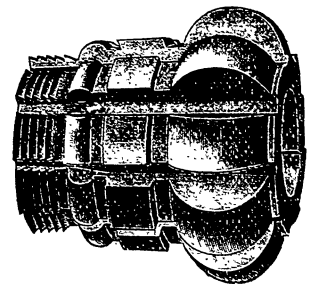
ROME MFG. COMPANY, Rome, N. Y.: Tea Kettles, Range Kettles, Tea and Coffee Pots, Boilers. Under date of May 15 the company issue a revised price-list of nickel plated and polished copper Tea Kettles, nickel plated and polished copper Range Kettles, nickel plated copper Tea and Coffee Pots.

COLBY WRINGER COMPANY, Montpelier, Vt., Surpluss, Dunn & Alder, 15 Murray street, New York, direct representatives: Wringers. The company present with their compliments a neat folder calling attention to the Premium Wringer. The inside pages are arranged as erasable tablets for memoranda in pencil.

W. N. DURANT, Milwaukee, Wis.: Durant Counting Device. A circular relating to the device contains a very flattering testimonial from the Hecker-Jones-Jewell Milling Company, who are using between 80 and 100 of them. Monthly calendars for June and July are also included, and a blotting pad is attached.

### Formed Milling Cutters.

The accompanying cut represents milling cutters offered by L. S. Starrett, Athol, Mass. The cutters for



Formed Milling Cutters.

milling parts of machinery can be made in a great variety of outlines, and can be sharpened, it is stated, by grinding without changing their form. Extra duplicate cutters will be made to order at any time; and the point is made that this is of importance when accuracy in duplication of machinery parts is required. These cutters, as well as gear cutters, slitting saws, &c., are made, it is explained, of the finest quality of steel and are tempered by an improved process.

### The Randall Woven Wire Fence.

The accompanying cuts represent a woven wire fence offered by Randall Fence Company, Le Roy, N. Y. The fence is shown complete in Fig. 1, while in Figs. 2 and 3 the mesh and cable are illustrated. The meshes measure 3 x 6 inches in size, to fence against

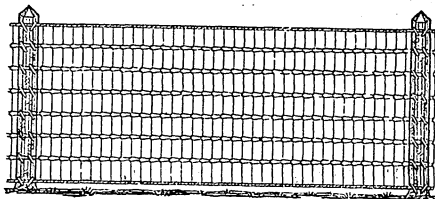


Fig. 1.—The Randall Woven Wire Fence.

anything from full grown poultry up to large stock. The lines of the meshes are all vertical and horizontal, made by connecting one wire to another with a series of loops forming oblong meshes, without tendency, it is remarked, to enlarge one way and contract another way under strain, while the selvage is made of a smooth, three-ply cable, uniformly wound and straight between the posts. It is pointed out that each verti-

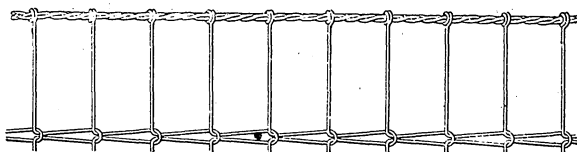


Fig. 2.—Section of Fence.

cal wire is joined to the next wire with six loops and two three-ply cables, Fig. 1, without twisting the grain of the wire in the least. The manufacturers claim that permanence of form is maintained in the fence by the line of draft each wire takes in being formed into loops; that it cannot assume any other shape, however severe the strain, while the spring of the loop keeps the fence taut under all conditions of heat and cold,

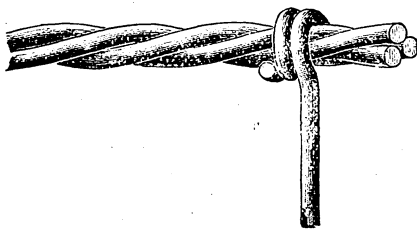


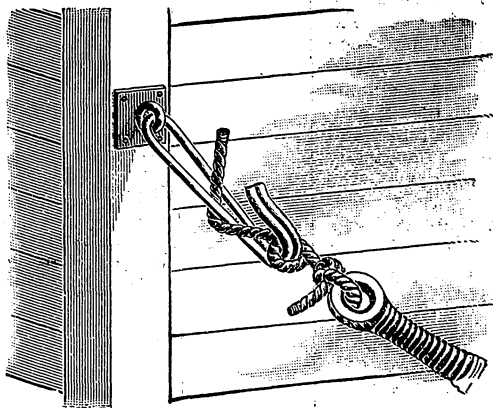
Fig. 3.—Cable, Full Size.

and that it will not sag between the posts. It is stated that by the use of cables along the selvage of the fence the greatest strength is supplied where it is most needed, as each cable will sustain 1500 pounds weight without injury to them. The fencing is galvanized and is made in three widths—six loops and two cables, 46 inches high; five loops and two cables, 40 inches high, and four loops and two cables 34 inches high. The fencing is put up in rolls of 200 feet (12 rods), and weighs from 130 to 165 pounds to the roll, according to its width.

BRACE HAYDEN of the Dunham Cargan & Hayden Company of New York has been made chairman of the Finance Committee of the Republican Club of this city.

### Hammock Tie and Hook.

The Tie Company, Unadilla, N. Y., are offering the tie and hook shown herewith. The manufacturers state that



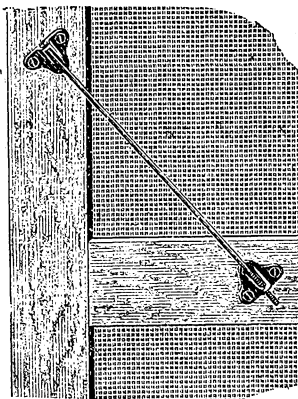
Hammock Tie and Hook.

the device will tie any kind of rope or string from  $\frac{1}{8}$  to  $\frac{1}{4}$  inch in diameter, and that the rope will break before it can be pulled out from the hook. While useful for many purposes, it is

particularly recommended by the makers for use on hammocks.

### Clark's Anti-Sag.

W. J. Clark & Co., Salem, Ohio, are putting on the market an anti-sag for screen doors, as herewith shown. It consists of a button headed screw,  $\frac{3}{8}$  x 12 inch, having neat lugs to fasten upon the hinged side and cross rail of screen



Clark's Anti-Sag.

doors. When attached to a door as shown in the illustration, the screw rod is tightened by means of a screw driver applied to the slot in the head of the rod—which for the sake of convenience is placed uppermost—to prevent the door sagging. The manufacturers claim that a door supplied with the device cannot sag, though through exposure the joints may become loose, and that if a door has already sagged it may be drawn up and held in shape by the device.

### The Peerless No. 2 Telephone Outfit.

Robert H. Ingersoll & Brothers, 65 Cortlandt street, New York, are offer-

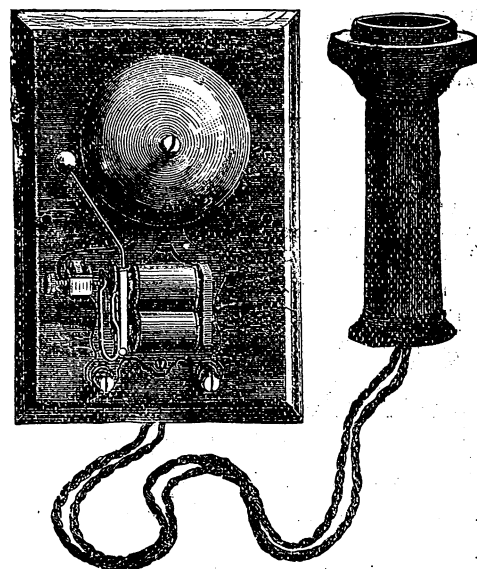


Fig. 1.—Call Bell and Receiver-Transmitter.

battery in Fig. 3, are furnished in duplicate, providing a call bell, receiver-

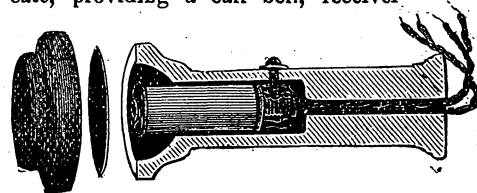


Fig. 2.—Receiver-Transmitter in Detail.

transmitter, and battery at each end of the line. The receiver transmitter,

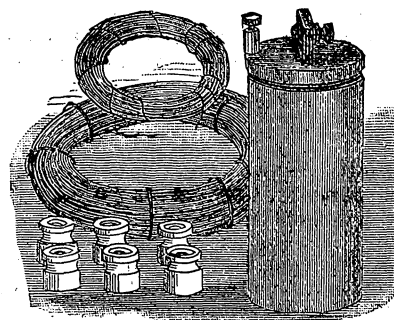


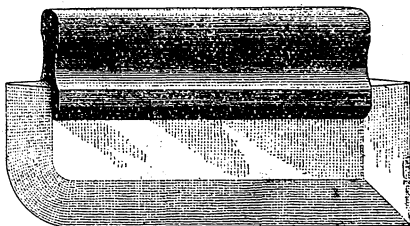
Fig. 3.—Battery and Accessories.

Fig. 2, is a combined instrument which is alternately placed to the mouth to

deliver the message, and then to the ear to receive the answer. It is stated that this will carry sound with the same distinctness on all lines of any length. The call bell, Fig. 1, ordinarily furnished with the outfit is constructed to ring for a distance of 1 mile and under. Bells of greater capability are furnished with outfits for long distances. The bell is mounted on a polished hardwood backboard, from which the receiver-transmitter is suspended by a telephone cord. At the back of the board, concealed from view, are the switches and connections, which are automatically operated by two push buttons at the side of the board, one to ring up and the other to connect the phone with the line wire and battery. The outfit here represented is sold at \$7.50, and is guaranteed by the makers to work perfectly over 1500 feet of No. 18 copper or No. 10 iron wire. By adding a battery to each end—making two batteries at each end of the line—the outfit will work to half a mile, and by the addition of another battery to each end it is made to work up to 1 mile. If proper calculation is made in ordering, enough wire, &c., may be shipped to cover all requirements. The manufacturers suggest that where distance will add largely to the cost of shipping the batteries be bought near at hand, if good batteries can be so secured.

#### The Boosinger Scraper.

Harris E. Thomas, Lansing, Mich., is offering the scraper herewith shown. It consists of a heavy piece of rub-



The Boosinger Scraper.

ber  $4\frac{1}{2}$  inches long and  $1\frac{1}{2}$  inches wide, with beveled edges, set in a wooden handle. The device is particularly adapted to scraping off dining room dishes of all shapes. The point is made that with the scraper this is done much quicker and neater than with a knife, and that all danger of marring or scratching the finest of china or silver is obviated. It is ex-

#### Hall's Diagonal Cutters.

The Interchangeable Tool Company, Utica, N. Y., and W. W. Pryor & Co., 81 Chambers street, New York, are introducing diagonal cutters No. 10, as

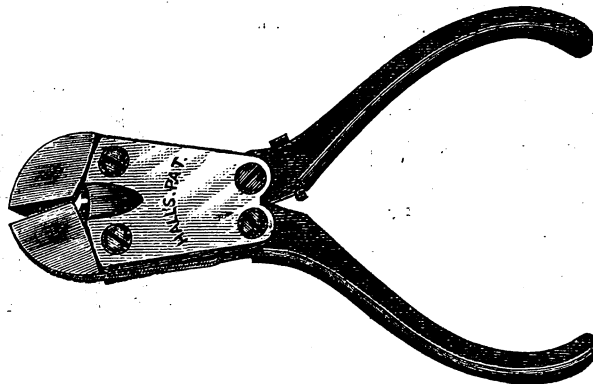


Fig. 1.—Hall's Diagonal Cutters.

here shown. The cutters are made upon the same principle as Hall's end cutting nippers, with compound lever, except that they are adapted to cutting on the side. Each jaw has double diagonal cutting faces, as shown in Fig. 2. The jaws are interchangeable and are sup-

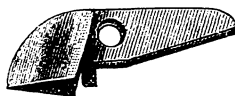
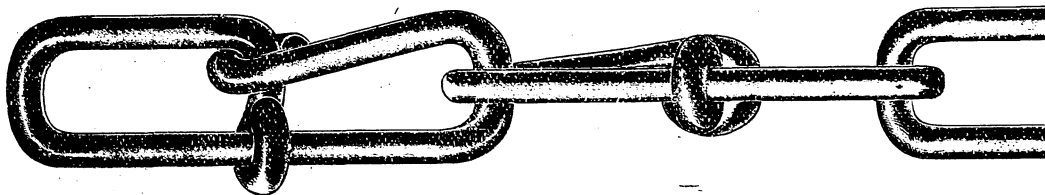


Fig. 2.—Jaw for Diagonal Cutters.

plied by themselves when desired. The cutters are furnished in regular finish, also nickel plated.

#### Eureka Weldless Chain.

Garland Chain Company, Rankin, Pa., are offering a weldless steel chain, as herewith shown. The illustration is of a  $\frac{1}{2}$ -inch chain and is represented full size. It is explained that the chain is made from steel wire especially adapted to the purpose, and that being automatically made it is uniform throughout, with no welds and no weak points. The point is made that the peculiar formation of the chain admits of two hooking in parts in each link, thus making one link equal to two



Eureka Weldless Chain.

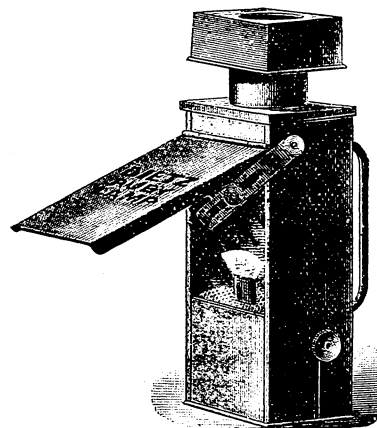
plained that the rubber blade being thick, with beveled edges, it will not roll under, but clings to the dish, and so effectually cleans even one of irregular surface that little more than a thorough rinsing in water is required to make it perfectly clean. The scraper may be used for drying windows or other smooth surfaces; also for cleaning fry pans, kettles, pudding dishes, basins, &c., preparatory to washing them.

links of the ordinary chain. The manufacturers claim that the chain is neat in appearance; that it has free play between links; that it does not kink, and that it combines lightness with strength. It is stated that the chain is adapted to use in trace chains, halters, tie out or lariat chains, end gate, well and agricultural chains, fencing and many other purposes for which the ordinary welded chain has heretofore been used.

that light can be thrown down into the developing dish and is shaded from the eyes, and that it furnishes ample light for the dark room. The lamps are made in a substantial and workmanlike manner, and are furnished in tin, japanned black; also in polished brass. The brass lamp is of the same pattern as the japanned tin one illustrated, with the exception of the top, which is circular in finish.

#### Dietz Ruby Lamp.

R. E. Dietz Company, 60 Laight street, New York, are putting on the market the lamp here shown. The lamp is designed for use in the dark



Dietz Ruby Lamp.

carried in the pocket. The manufacturers state that the lamp is so constructed that it is well supplied with air; that it does not leak white light; that it will not overheat, though kept burning for hours; that the flame is regulated from the outside of the lamp;

**Billings' Magazine Screw Driver.**

The Billings & Spencer Company, Hartford, Conn., are introducing a magazine screw driver, as shown in the accompanying cuts, which are full size. The four screw driver blades are pivoted to a slide and cannot be lost unless the

is  $3\frac{1}{2}$  inches and is designed for sportsmen or any one requiring a compact tool of the kind.

**The Witte Tool Cabinet.**

The accompanying illustration represents a tool cabinet being put on the

and useful selection of tools, so that when the doors and lid are opened each of the 100 or more tools included in the assortment, except such of the smaller ones as may be in the drawers, are in full view. In arranging the tools in their places particular care has been taken to give each article its proper position—the one in which the tool would naturally be removed from or returned to the cabinet. Thus the planes fit into spaces cut out for them in the bottom of the cabinet, in such positions that they are ready for instant use when taken in the hand, and are replaced without change of position in the hand. This idea has been carried out in the entire arrangement of tools. The fastenings for all the tools are so made as to tightly secure them in place, at the same time allowing them to be easily removed or replaced, while the location of any tool is not allowed to

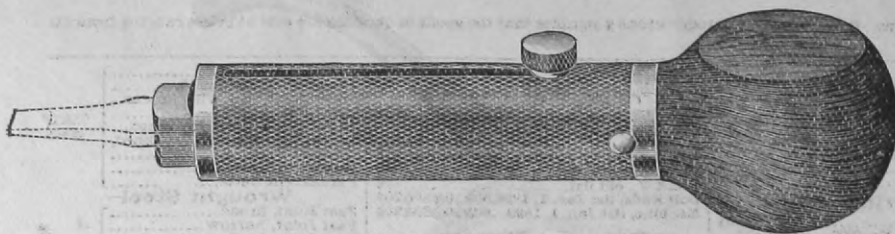
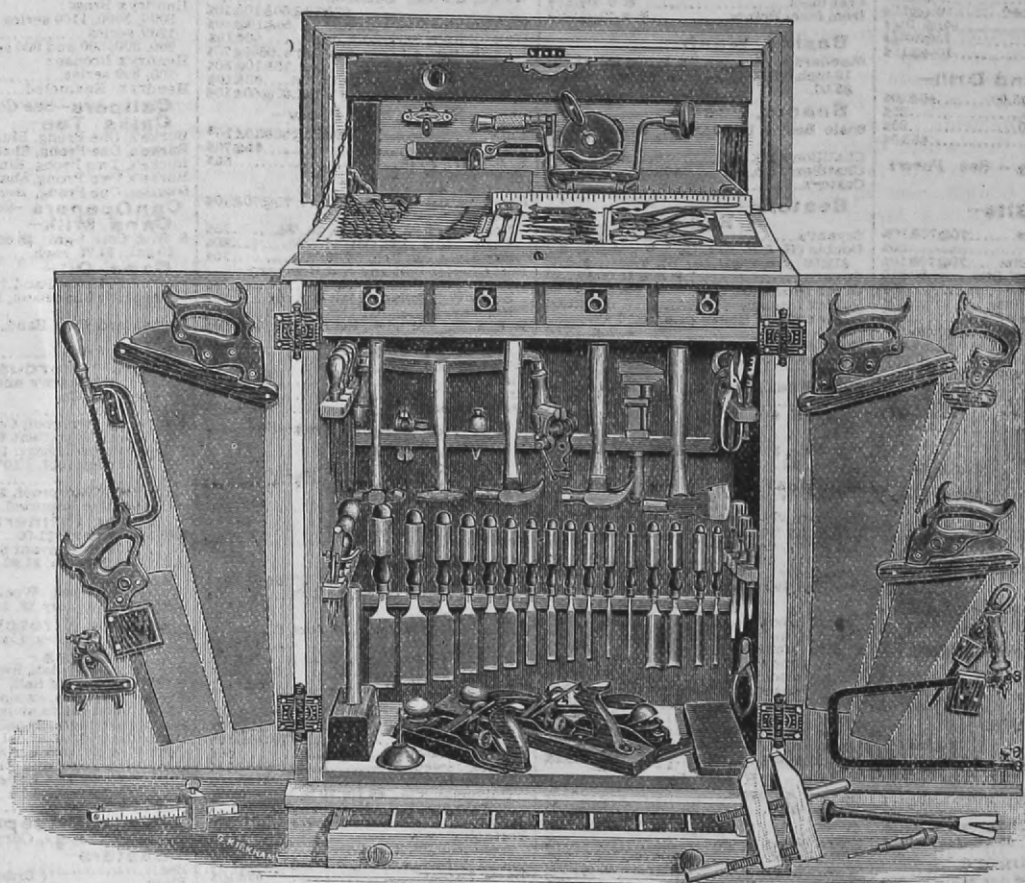


Fig. 1.—Billings' Magazine Screw Driver.

entire tool is lost. By raising the locking bolt and running forward the slide

market by the Francis T. Witte Hardware Company, 106 Chambers street,



The Witte Tool Cabinet.

to the end of the slot the screw driver blades are swung out. When the size of screw driver is selected and turned

New York. The cabinet is made of hard wood, finely polished, in antique oak or ash, cabinet finish, and when

interfere with the convenient reaching of any of the others. Particular attention has been given to the careful selection of the sorts of tools for the cabinet, the assortment having been limited to such as may be required for the usual purposes of a gentleman's household or the wants of an amateur. Brass cylinder locks with flat steel keys are provided for the lid, doors and lower drawer. Among the tools furnished with the cabinet are a plumb and level, try and miter squares, tape measures, ratchet brace, set of auger bits, 7 chisels, 3 gouges, rule, expansive bit, 4 pairs of pliers, steel square, mounted oil stone, 7 saws, saw set, 5 files and rasps, drawing knife, 4 planes, 4 hammers, hatchet, vise, hand vise, 3 wrenches, 3 screw drivers, caliper, divider, pair of hand screws, mallet, 10 bits, 4 punches, hand drill, oiler and several smaller tools. Cabinet No. 100 is supplied with the best of tools, and No. 200 with tools of a cheaper grade.

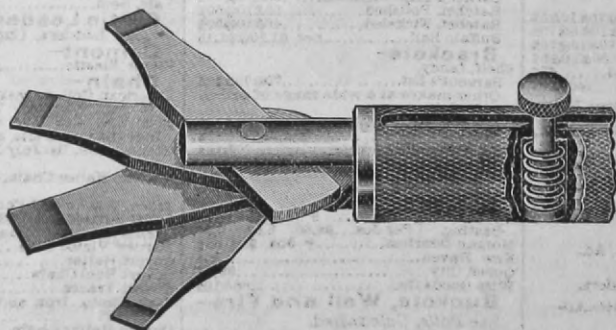


Fig. 2.—The Four Sizes of Screw Drivers.

forward, the slide is drawn back into the handle and the tool is ready for use. The total length of the tool when closed

closed is 44 inches high, 31 inches wide and 14 inches deep. The cabinet is ingeniously constructed to hold a large



**Chalk Lines—See Lines.****Checks, Door—**

Bardsley's.....20%  
Unity.....30%

**Chisels—**

Socket Framing and Firmer  
Mfr. Ohio Tool Co.....75¢100¢80%

P. S. & W.....30%  
Witherby.....30%

Buck Bros.....30%  
Charles Buck.....30%

Douglas.....75¢75¢100%  
Merrill.....60¢100¢60¢100¢50%

L. & I. J. White.....30¢80¢50%  
Tanged and Miscellaneous.....30%

Buck Bros.....30%  
Charles Buck.....30%

Butcher's.....\$4.75 to \$5.00 to 2  
Spear & Jackson's.....\$5 to 2

Tanged Firmers.....50¢50¢100%  
L. & I. J. White, Tanged.....25¢50%

Cold Chisels, fair quality, P. S. & W.....14¢100%

**Chucks—**

Beach Pat.....each, \$8.00.....20%

Danbury.....each, \$6.00, 30¢30¢40%

Graham Patent.....35¢40%

Morse's Adjustable, each, \$7.00, 20¢20¢25%

Syracuse, Bals Pat.....25%

Skinner Patent Chucks.....40%

Combination Lathe Chucks.....40%

Drill Chucks.....25%

Independent Lathe Chucks.....25%

Planer Chucks.....20%

Universal Lathe Chucks.....40%

Union Mfg. Co.....40%

Combination.....40%

Independent.....40%

Universal.....40%

Victor.....\$3.50, 25%

**Churns—**

Modern Star Barrel Churn, each  
6 gal., \$2.80; 10 gal., \$2.75; 15 gal.,  
\$3.00; 20 gal., \$3.25.

Timin Union, each, 5 gal. \$3.25; 7 gal.,  
\$3.75; 10 gal., \$4.25.

**Clamps—**

Adjustable, Cincinnati.....15¢10%

Adjustable, Hammers.....15¢15¢5%

Adjustable, Stearns.....30¢30¢10%

Barnes' Machine's Clamps.....35¢40%

Cabinet, Sargent's.....70¢10%

Carpenter's, Cincinnati.....25¢10%

Carriage Makers', P. S. & W. Co., 40¢10%

Carriage Makers', Sargent's, 75¢75¢5%

Eberhard Mfg. Co., 40¢50¢10%

Joiners' Clamps, Tatum's.....25¢10%

P. S. & W. Co.'s Wrought Iron.....40%

Saw Clamps, see Vices, Saw Filers

Stearns' Malleable, with Wrought Iron  
Screw.....75¢75¢5%

Warner's.....40¢100¢40¢100¢25%

**Cleavers, Butchers—**

Beatty's.....40¢50¢40¢10%

Bradley's.....40¢50¢10%

Poster Bros.....30%

New Haven Edge Tool Co.'s.....30%

Nichols Bros.....30%

P. S. & W.....30¢45¢35¢10%

Schulte, Lohoff & Co.....40¢40¢5%

L. & I. J. White.....25%

**Clips—**

Baker Axle Clips.....25%

Norway Axle.....65¢100¢5%

Norway Spring Bar Clips.....65¢50¢5%

Ad grade Norway Axle.....65¢50¢5%

Steel Felloe Clips.....P. S. & W. 40%

Superior Axle Clips.....70%

Wrought Iron Felloe Clips.....P. S. & W. 50%

**Cloth and Netting, Wire—**

See Wire, etc.

**Cockeyes—**

Hardware list (Globe, Kerosene, Lever  
Bibbs, Racking, etc.).....60¢20¢00¢10

**Coffee Mills—See Mills, Coffee.****Collars—**

Brass, Pope & Stevens' list.....40%

Chapman Mfg. Company, new list.....40%

Embossed, Gift, Pope & Stevens' list.....30¢10%

Leather, Pope & Stevens' list.....40%

Medford Fancy Goods Co.....40¢100¢50%

**Combs, Curry—**

American Curry Comb Co.....35¢40%

Fitch's.....60¢100¢50¢100¢10%

Gibb's Magic.....\$ doz., \$2.00

Kohler's Humane.....\$ doz., \$1.75

Kohler's Magic Oscillating.....\$ doz., \$2.00

Rubber, per doz., \$1.00.....25%

**Compasses, Dividers &c—**

Compasses, Calipers, Dividers, 70¢100¢75%

Bemis & Call Co.'s.....65%

Dividers.....65%

Calipers, Patent Inside.....65%

Calipers, Patent Outside.....65%

Calipers, Inside or Outside.....60%

Compasses.....60¢50%

Excelsior.....50%

Hercules, Drab.....P. S. & W. 30%

Hercules, White.....P. S. & W. 25%

White Cotton Braided, fair.....P. S. & W. 25¢25%

**Wire Picture—**

Braided or Twisted.....80¢50¢80¢15%

**Corkscrews—See Screws, Cork.****Corn Knives and Cutters—**

See Knives, Corn.

**Crackers, Nut—**

Acme.....50%

Japanned, P. S. & W. \$30.....50%

Nickel Plated, P. S. & W. \$30.....10%

Table (H. & B. Mfg. Co.).....40%

Turner & Seymour Mfg. Co.....50%

**Cradles—**

Grain.....50¢20¢50¢50¢25%

**Crayons—**

White Crayons, P. S. & W. gross, 60¢60%

Cases, 100 gr., \$3.75 to \$4.25, at factory.

D. M. Steward Mfg. Co.....40%

Metal Workers' P. S. & W. gross, \$2.50, 20¢25%

Railroad, P. S. & W. gross, 2.00, 20¢25%

Rolling Mill, P. S. & W. gross, 2.50, 20¢25%

Soapstone Pencils, P. S. & W. gross, 1.50, 20¢25%

See also Chalk.

**Creamery Pails—See Pails, Creamery.****Crow Bars—See Bars, Crow.****Curry Combs—**

See Combs, Curry.

**Cutters—**

Meat—

American.....1 2 3 4 5 6 80%

Each.....\$5 \$7 \$9 \$25 \$50 \$80

Enterprise.....10 12 22 32 42

Nos.....\$3 \$3.50 \$4 \$6 \$15

Dixon's, P. S. & W. doz.....40¢40¢5%

Nos.....\$1.00 \$1.75 \$1.90 \$3.00

Draw Cut, each:

Nos. 5 2 6 8

\$50 \$75 \$80 \$225.....20¢25%

Hale's, P. S. & W. doz.....70%

Nos.....11 13 13

Home No. 1, P. S. & W. doz.....\$27.00 \$33.00 \$45.00

Little Giant, P. S. & W. doz.....\$26.00.....55¢40%

Nos. 305 \$10 \$11 \$20 \$22

Miles' Challenge, P. S. & W. doz.....\$35.00 \$48.00 \$60.00 \$72.00 \$85.00

Nos.....\$45¢45¢10%

Triumph No. 505, P. S. & W. doz.....\$22.00 \$30.00 \$40.00

Woodruff's, P. S. & W. doz.....\$21.00.....25¢30%

Nos.....100 150

Chadborn's Smoked Beef Cutter, P. S. & W. doz.....\$15.00 \$18.00

Enterprise Beef Shavers.....20%

**Slaw and Kraut—**

Tucker & Dorsey Mfg. Co.: 40%

Kraut Cutters, 1 Knife, P. S. & W. gross.....\$21.00

Slaw Cutters, 2 Knife, P. S. & W. gross.....\$0.00

**Tobacco—**

Acme.....P. S. & W. doz., \$20.00, 40%

All Iron.....P. S. & W. doz., \$4.25

Champion.....20¢100¢30%

Nashua Look Co.'s, P. S. & W. doz., \$18.00, 50¢55%

National.....P. S. & W. doz., \$21.00, 30%

Sargent's.....P. S. & W. doz., \$24.00, 55¢10%

**Washes—**

Appleton's.....P. S. & W. doz., \$16.00, 60¢10%

Bonney's.....P. S. & W. doz., \$10.00, 30%

Cincinnati.....P. S. & W. doz., \$11.00, 35¢40%

Johnson's.....P. S. & W. doz., \$11.00, 35¢40%

Penny's, P. S. & W. Pol. \$14; Jap'd, \$16, 55%

Smith's Pat.....P. S. & W. doz., \$12.00, 20¢100%

**Diggers, Post Hole, &c—**

Cronk's Post Bars, P. S. & W. doz.....\$80.00

Eureka Diggers.....P. S. & W. doz., \$10.50 to \$12.00

Fletcher Post Hole Augers, P. S. & W. doz.....\$36.00

Gem Improved, P. S. & W. doz., \$9.00 to \$10.00 net

Gibbs' Columbia.....P. S. & W. doz., \$12.00

Gibbs' Hustler.....P. S. & W. doz., \$10.00

Gibbs' Imperial.....P. S. & W. doz., \$12.00

Gibbs' National.....P. S. & W. doz., \$12.00

Gibb's Post Hole Digger.....P. S. & W. doz., \$12.75

Kohler's Hercules.....P. S. & W. doz., \$14.00

Kohler's Invincible.....P. S. & W. doz., \$12.00

Kohler's Little Giant.....P. S. & W. doz., \$18.00

Kohler's New Champion.....P. S. & W. doz., \$8.00

Kraus's.....P. S. & W. doz., \$20.00, 10%

Samson.....P. S. & W. doz., \$34.00.....25¢25¢10%

Schneider.....P. S. & W. doz., \$18.00

Shimer's Hollow Handle.....P. S. & W. doz., \$24.00

Vaughan's Post Hole Auger, P. S. & W. doz.....\$3.50 to \$9.50

**Dividers—See Compasses.****Dog Collars—See Collars, Dog.****Door Checks—**

See Checks, Door.

**Door Springs—**

See Springs, Door.

**Drawers, Money—**

Money Drawers, P. S. & W. doz.....\$18 to \$20

Waddell's Improved, No. 1, P. S. & W. doz.....\$15.00

Waddell's Improved, No. 2, P. S. & W. doz.....\$18.00

Waddell's Comb. Cutlery Case and  
Alarm Till.....\$12.50

**Drawing Knives—**

See Knives, Drawing.

**Drills and Drill Stocks—**

Automatic Boring Tools.....\$1.75 to \$1.85

Bench Drills, Stearns.....\$50

Blacksmiths'.....each \$1.75

Blacksmiths' Self-Feeding, each \$7.50, 20%

Breast, Bartholomew's.....each \$2.50, 25%

Breast, Millers Falls.....each \$3.00, 25%

Breast, P. S. & W.....40¢10%

Breast, Wilson's.....30¢5%

Chicopee Automatic Drill.....20¢10%

Goodell Automatic Drills.....40¢40¢10%

Ratchet, Curtis & Drills.....25%

Ratchet, Ingersoll's.....25%

Ratchet, Merrill's.....20¢20¢5%

Ratchet, Moore's Triple Action.....25¢30%

Ratchet, Parker's.....20¢20¢5%

Ratchet, Weston's.....20¢25%

Ratchet, Whitney's.....20¢10%

Whitney's Hand Drill, Plain, \$11.00

Adjustable.....\$12.00.....20¢10%

**Twist Drills—**

Cleveland.....50¢100¢10%

Diamond, W. & B.....50¢100¢10%

Graham's Pat. Groove Shank.....50¢100¢10%

Morse.....50¢100¢10%

New Process.....50¢100¢10%

Standard.....50¢100¢10%

Syracuse (Metal list).....50¢10%

**Drill Bits or Bit Stock**

Drills—See Augers and Bits.

**Drill Chucks—See Chucks.****Dripping Pans—**

See Pans, Dripping.

**Drivers, Screw—**

Allard's Spiral, new list.....25%

Brace Screw Drivers.....25¢10%

Buck Bros.....30%

Buck Bros' Screw Driver Bits.....27¢40%

Clark's Pat.....35¢40%

Cincinnati.....35¢10%

Champion.....25¢10%

Diston's.....50%

Douglas Mfg. Co.....20¢20¢10%

Elkhart's Socket and Ratchet.....25¢25¢10%

Fay's Hol. H. H. Sets.....No. 2, \$12.00, 45%

Gay & Parsons.....



Plates.....45¢  
 Roper's Night Latches.....15¢  
 R. & E. Mfg. Co., list Mar. 20, 1889.....60¢  
 Sargent & Co., list Apr. 1, 1891.....60¢  
 Warner's Burglar Proof.....\$3.00, 50¢  
 Yale.....net prices

### Elevator—

Moore's.....38¢

### Padlocks—

Wrought Iron Padlocks:  
 Brittan, Graham & Mathes, list Jan. 1, 1894.....75¢  
 Mallory, Wheeler Co., list Jan. 1, 1894.....75¢  
 Norwich Lock Mfg. Co., list June 10, 1891.....50¢  
 Russell & Erwin Mfg. Co., list June 10, 1891.....50¢  
 Sargent & Co., list January 1, 1891.....75¢  
 William Wilcox Mfg. Co., list Jan. 1, 1891.....75¢  
 Ames Sword Co. up to No. 103 incl. 50¢  
 Ames Sword Co. above No. 103.....60¢  
 Barnes Mfg. Co.....40¢  
 Champion Padlocks.....40¢  
 A. E. Deltz.....40¢  
 Eagle.....40¢  
 Eureka, Eagle.....40¢  
 E. T. Fraim's Keystone Scandinavian.....90¢  
 1010 line.....90¢  
 120 line.....90¢  
 125, 610 and 209 lines.....70¢  
 All other numbers.....70¢  
 Horseshoe.....\$3.50, 50¢  
 Hotchkiss.....30¢  
 Rock's.....30¢  
 Romer's Nos. 0 to 91.....30¢  
 Romer's Scandinavian, &c., Nos. 100 to 605.....15¢  
 Scandinavian.....90¢  
 Slaymaker, Barry & Co., No. 1010 line.....90¢  
 No. 41 line.....50¢  
 No. 61 line.....60¢  
 No. 21 line.....70¢  
 No. 109 line.....90¢  
 Yale Lock Mfg. Co.'s.....net prices

### Sash, &c.—

Attwell Mfg. Co.....25¢  
 Champion Safety list January 1893.....75¢  
 Clark's No. 1, 110; No. 2, 38 gr.....30¢  
 Common Sense, Jap'd, Cop'd & Br'd.....gr \$4.00  
 Common Sense, Nickel Plated.....gr \$10.00  
 Corbin's Daisy, list Feb. 18, 1888.....70¢  
 Davis Bronze, Barnes Mfg. Co.....60¢  
 Ferguson's.....35¢  
 Fish (Liesche's pat.), No. 100, gr \$8; No. 105, gr \$10.....50¢  
 Giant, list Jan. 1892.....70¢  
 Hammond's Window Springs.....40¢  
 Hugin's New Sash Locks.....25¢  
 Hugin's Sash Balances.....25¢  
 Ives' Patent.....60¢  
 Kempshall's Gravity.....60¢  
 Kempshall's Model.....60¢  
 Monarch.....50¢  
 Payson's Perfect.....60¢  
 Reading.....60¢  
 Security.....30¢  
 Universal.....30¢  
 Victor.....60¢  
 Walker's.....10¢  
 Wolcott's.....60¢

### Lumber Tools—

See Tools, Lumber.

### Lustro—

Four-ounce bottles.....\$1.75; 7 gross.....\$17.00

### Machines.

#### Boring—

Without Augers, Upright, Angular.  
 Boss, Carpenters' 3.80  
 Boss, Ship Bldrs' 3.85  
 Douglas.....\$6.75, 50¢  
 Jennings.....6.75, 50¢  
 Millers Falls.....7.50, 25¢  
 Phillips' Patent with Auger.....7.00, 7.50  
 Snell's, Rice's Pat 5.50 6.75, 40¢

#### Fluting—

American, 5 in., \$3.00; 6 in., \$3.40; 7 in., \$4.50 each.....35¢  
 Combined Fluter and Sd. Iron.....30¢  
 Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in., \$6.50 each.....35¢  
 Crown Hand Fluter, Nos. 1, \$15.00; 2, \$12.50; 3, \$10.00; 4, \$8.25.....30¢  
 Crown Jewel, 6 in.....\$5.50 each, 35¢  
 Domestic Fluter.....each, \$1.50  
 Eagle, 3 1/2-inch Rolls, \$2.15.....35¢  
 Eagle, 5 1/2-inch Rolls, \$2.85.....35¢  
 Knox, 3 1/2-inch Rolls.....\$3.25 each, 35¢  
 Knox, 6-inch Rolls.....\$3.80 each, 35¢

#### Holting—

Moore's Anti-Friction Differential Pulley Block.....20¢  
 Moore's Hand Hoist with Lock Brake.....20¢  
 Moore's Rope Differential Pulley Block.....60¢  
 Maris & Beckley (Teal Patent).....30¢  
 See also Blocks.

#### Washing—

Sair and Square.....\$2.00  
 Anthony Wayne, \$2.00, No. 1, \$4.2; No. 2, \$5.8; No. 3, \$4.2  
 Wayne American.....\$3.00  
 Wellsell.....\$3.00  
 Western Star \$2.00, No. 2, \$3.0; No. 3 \$3.9

### Mallets—

B. & L. Block Co., Hickory & L. V. 30¢  
 Vibre Head, Stearns.....33¢  
 Hickory.....20¢  
 Lignumvite.....20¢

### Mattocks—Regular list.

Standard Fibreware, No. 1, each \$2.00  
 dozen, \$3.50; 1/2 peck, \$3.00

### Meat Cutters—

See Cutters, Meat.

### Menders—

Harness.....\$1.75  
 Hudson's Hose Menders, in set, \$1.25  
 Hudson's Hose Bands.....\$1.25

### Milk Cans—See Cans, Milk.

### Mills—

Box and Side, list Jan. 1, 1888, 60¢  
 Net prices are often made which are lower than above discount.  
 American, Enterprise Mfg. Co., list Jan. 17, 1893.....20¢  
 National List, Jan. 1, 1894.....30¢  
 Swift, Lane Bros.....30¢  
 Waddell's New Box Mills, Ideal Brand, New List.....60¢

### Mining Knives—

See Knives, Mining.

### Molasses Cates—

See Cates, Molasses.

### Money Drawers—

See Drawers, Money.

### Mowers, Lawn—

Highest 10 in. 12 in. 14 in.  
 grade \$4.00 \$5.25 \$1.50 \$6.00 \$5.00 \$6.75  
 Good \$3.00 \$3.25 \$3.50  
 Cheap \$2.25 2.50 2.75

### Muzzles—

Safety.....\$3.00, 25¢

### Nails—

Cut and Wire, See Trade Report.

Wire Nails, Papered.

Association list, May 1, 1892.....85¢

Hungarian, Finishing, Upholsterers', &c. See Tacks.

### Horse—

A. C. Nos. 7, 8, 9, 10  
 25¢ 23¢ 22¢ 21¢ 20¢  
 American.....40¢  
 Anchor.....35¢  
 Ausable.....28¢  
 Capewell.....19¢  
 C. B. K.....25¢  
 Champion.....25¢  
 Champlain.....28¢  
 Clinton, Fin.....19¢  
 Empire Bronzed.....14¢  
 Essex.....28¢  
 Lyra.....9¢  
 Maud S.....25¢  
 Northwest'n.....25¢  
 Putnam.....23¢  
 Snowden.....9¢  
 Standard.....23¢  
 Vulcan.....23¢  
 Western.....23¢

### Picture—

Brass Head, Combination list.....50¢  
 Brass Head, Sargent's list.....60¢  
 Corbin Head, Combination list.....40¢  
 Foreman Head, Sargent's list.....60¢  
 Niles' Patent.....40¢

### Nail Pullers—See Pullers, Nail.

### Nail Sets—See Sets, Nail.

### Nippers, See Pliers and Nippers

### Nut Crackers—

See Crackers, Nut.

### Nuts—List Dec. 18, 1889.

Cold Punched.....5.00¢ 5.10¢ off list  
 Hot Pressed.....5.80¢ 6.50¢ off list  
 In packages of 100 lb, add 1-10¢ lb, net; in packages less than 100 lb, add 1/2¢ lb, net.

### Oakum—

Best or Government.....\$1.75  
 Navy.....\$1.75  
 U. S. Navy.....\$1.75

### Oil Tanks—See Tanks, Oil.

### Oilers—

Brass and Copper.....50¢  
 Zinc and Tin.....70¢  
 Broughton's Brass.....50¢  
 Broughton's Zinc.....60¢  
 Malleable, Hammers' Improved, No. 1, \$3.00; No. 2, \$4.00; No. 3, \$4.40.....10¢  
 Malleable, Hammers' Old Pattern, same list.....50¢  
 Olmstead's Brass and Copper.....50¢  
 Olmstead's Tin and Zinc.....60¢  
 Prior's Pat. or "Paragon" Brass.....60¢  
 Prior's Pat. or "Paragon" Zinc.....70¢  
 Steel, Draper & Williams.....50¢  
 Rust.....60¢

### Openers, Can—

American.....\$1.75  
 Champion.....\$2.00  
 Domestic.....\$2.00  
 Duplex.....\$2.50  
 Eureka.....\$2.50  
 Excelsior, No. 1 \$2.50; No. 2 \$1.50.....40¢  
 French, No. 4.....\$2.25  
 Iron Handle, No. 5.....\$2.00  
 Lyman's.....\$3.75  
 Messenger's Comet.....\$3.00  
 Moore's.....\$3.00  
 Sardine Sifters.....\$2.75  
 Sprague, No. 1, 55¢; 2, 60¢; 3, 65¢.....\$2.75  
 State.....\$2.75  
 Universal.....\$3.00  
 World's Best, \$2.00; No. 1, \$2.00; No. 2, \$2.40; No. 3, \$3.00.....\$2.00

### Packing, Steam—

#### Rubber—

Standard, fair quality.....70¢  
 Inferior quality.....75¢  
 Extra.....60¢  
 Jenkins' Standard.....\$2.00  
 N. Y. B. & P. Co., Double Diamond.....60¢  
 N. Y. B. & P. Co., Salamander.....45¢  
 N. Y. B. & P. Co., Carbon.....70¢

#### Miscellaneous—

American Packing.....\$1.00  
 Italian Packing.....\$1.00  
 Jute.....\$1.00  
 Russia Packing.....\$1.00

### Pails—

S. S. & Co., 12 qt., \$7.00; 20 qt., \$7.25  
 \$ doz.

### Galvanized Pails—

10 Quart.....\$2.00  
 12 Quart.....2.25  
 14 Quart.....2.50

### Galvanized Buckets—

10 Quart.....\$2.50  
 12 Quart.....2.75  
 14 Quart.....3.00

### Indurated Fiber Ware—

Fire Pails, deep.....\$4.80  
 Fire Pails, round bottom.....\$5.40  
 Milk, 14 qt.....\$5.40  
 Stable, 14 qt.....\$6.00  
 Star Pails, 12 qt.....\$4.20

### Standard Fiber Ware—

Buggy Pails.....\$3.00  
 Chamber Pails, 14 qt.....\$7.00  
 Dairy Pails, 14 qt.....\$7.75  
 Fire Pails, No. 1, 14 qt.....\$7.75  
 Fire Pails, No. 2, 14 qt.....\$7.75  
 Horse Pails.....\$4.00  
 Slop Jars (bal. trap).....\$5.00  
 Sugar Pails.....\$5.00  
 Water Pails, 12 qt.....\$3.15

### Pans—

Large sizes.....\$1.50  
 Small sizes.....\$1.50  
 Silver & Co. (Covered).....\$1.50

### Fry—

Standard list:  
 No.....\$3.00  
 No.....\$3.75  
 No.....\$4.25  
 No.....\$4.75  
 No.....\$5.25  
 No.....\$6.00  
 No.....\$7.00  
 No.....\$8.00  
 No.....\$9.00  
 Polished, regular goods.....\$7.50  
 Acme Fry Pans.....\$6.00

### Dust—

Steel Edge, No. 1.....\$1.75  
 Roasting and Baking.....\$1.75  
 Columbian & Co., Nos. 10, \$3; 20, \$2.25; 30, \$2.50 each.....\$2.00

### Paper and Cloth—

Sand and Emery.....\$1.00  
 Sibley's Emery and Crocus Cloth.....\$1.00

### Parers—

Advance.....\$4.25  
 Baldwin.....\$4.75  
 Bonanza.....\$5.00  
 Daisy.....\$5.50  
 Dan.....\$5.50  
 Eclipse.....\$5.00  
 Eureka, 1888.....\$6.00  
 Family Bay State.....\$12.00  
 Favorite.....\$5.00  
 Gold Medal.....\$4.00  
 Ideal.....\$4.00  
 Improved & W. Co.....\$27.00  
 Little Star.....\$4.00  
 Monarch.....\$13.50  
 New Lightning.....\$5.50  
 Oriole.....\$4.00  
 Penn.....\$3.00  
 Perfection.....\$4.00  
 Reading 72.....\$3.75  
 Reading 72.....\$4.00  
 Rocking Table.....\$5.50  
 Turn Table.....\$4.50  
 Victor.....\$13.50  
 Waverly.....\$4.00  
 White Mountain.....\$4.00

### Potato—

Antrim Combination.....\$5.50  
 Saratoga.....\$5.50  
 White Mountain.....\$4.50

### Pencils, Soapstone—

See Crayons.

### Pickers, Fruit—

Prize Fruit Pickers.....50¢  
 Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00.....60¢

### Picture Nails—

See Nails, Picture.

### Pinking Irons—

See Irons, Pinking.

### Pins—

Humason, Beckley & Co.'s.....60¢  
 Improved & W. Co.....\$5.00  
 Sargent & Co.'s, \$17 and \$18.....60¢

### Escutcheon—

Brass.....70¢  
 Iron, list No. 11, 1885.....75¢

### Pipe, Wrought Iron

1 1/2 and under, Plain.....\$1.00  
 1 1/2 and under, Galv.....\$1.00  
 1 1/2 and over, Plain.....\$1.00  
 1 1/2 and over, Galv.....\$1.00  
 Boiler Tubes, list Oct. 24, 1892.....\$1.00  
 Casing, list Nov. 16, 1892.....\$1.00  
 Cold Drawn Seamless Steel Tubing.....\$1.00  
 Inserted Joints Casing, list Nov. 16, 1892.....\$1.00  
 Steel Boiler Tubes.....\$1.00  
 Bailey's (Stanley R. & L. Co.).....\$1.00

### Planes and Plane Irons—

#### Wood Planes—

Molding.....\$1.00  
 Bench, First quality.....\$1.00  
 Bench, Second quality.....\$1.00  
 Bailey's (Stanley R. & L. Co.).....\$1.00  
 Iron Planes.....\$1.00  
 Birmingham Plane Co. 60¢  
 Chapin's Iron Planes.....\$1.00  
 Day Iron Planes.....\$1.00  
 Gage Tool Co.'s Self Sharpening.....\$1.00  
 Miscellaneous Planes (Stanley R. & L. Co.).....\$1.00  
 Sargent's.....\$1.00  
 Standard Tool Co. 50¢  
 Stearns' Iron Planes.....\$1.00  
 Auburn Thistle.....\$1.00  
 Buck Bros.....\$1.00  
 Butcher's.....\$1.00  
 Ohio.....\$1.00  
 Sandusky.....\$1.00  
 Stanley R. & L. Co.'s.....\$1.00  
 L. & J. White.....\$1.00

### Plates—

Follow.....\$1.00

### Pliers and Nippers—

Button's Patent.....60¢  
 Carew's Pat. Wire Cutters.....20¢  
 Cronk's 5 in., \$15.00; 10 in.....\$2.00  
 Cronk's Button Pattern.....\$1.00  
 Cronk's Carrier Pliers.....\$1.00  
 Eureka Pliers and Nippers.....40¢  
 Gas Pliers.....60¢  
 Gas Pliers, Cutlar's Nickel Plated.....\$1.00  
 Hair's No. 2, 5 in., \$18.50; No. 4, 7 in., \$21.00.....\$1.00  
 Humason & Beckley Mfg. Co. 60¢  
 Lindsay's Giant, No. 65, 5 in., \$1.00.....\$1.00  
 Morrill's Parallel, \$1.00, \$1.20, \$1.40, \$1.60, \$1.80, \$2.00, \$2.25, \$2.50, \$2.75, \$3.00, \$3.25, \$3.50, \$3.75, \$4.00, \$4.25, \$4.50, \$4.75, \$5.00, \$5.25, \$5.50, \$5.75, \$6.00, \$6.25, \$6.50, \$6.75, \$7.00, \$7.25, \$7.50, \$7.75, \$8.00, \$8.25, \$8.50, \$8.75, \$9.00, \$9.25, \$9.50, \$9.75, \$10.00, \$10.25, \$10.50, \$10.75, \$11.00, \$11.25, \$11.50, \$11.75, \$12.00, \$12.25, \$12.50, \$12.75, \$13.00, \$13.25, \$13.50, \$13.75, \$14.00, \$14.25, \$14.50, \$14.75, \$15.00, \$15.25, \$15.50, \$15.75, \$16.00, \$16.25, \$16.50, \$16.75, \$17.00, \$17.25, \$17.50, \$17.75, \$18.00, \$18.25, \$18.50, \$18.75, \$19.00, \$19.25, \$19.50, \$19.75, \$20.00, \$20.25, \$20.50, \$20.75, \$21.00, \$21.25, \$21.50, \$21.75, \$22.00, \$22.25, \$22.50, \$22.75, \$23.00, \$23.25, \$23.50, \$23.75, \$24.00, \$24.25, \$24.50, \$24.75, \$25.00, \$25.25, \$25.50, \$25.75, \$26.00, \$26.25, \$26.50, \$26.75, \$27.00, \$27.25, \$27.50, \$27.75, \$28.00, \$28.25, \$28.50, \$28.75, \$29.00, \$29.25, \$29.50, \$29.75, \$30.00, \$30.25, \$30.50, \$30.75, \$31.00, \$31.25, \$31.50, \$31.75, \$32.00, \$32.25, \$32.50, \$32.75, \$33.00, \$33.25, \$33.50, \$33.75, \$34.00, \$34.25, \$34.50, \$34.75, \$35.00, \$35.25, \$35.50, \$35.75, \$36.00, \$36.25, \$36.50, \$36.75, \$37.00, \$37.25, \$37.50, \$37.75, \$38.00, \$38.25, \$38.50, \$38.75, \$39.00, \$39.25, \$39.50, \$39.75, \$40.00, \$40.25, \$40.50, \$40.75, \$41.00, \$41.25, \$41.50, \$41.75, \$42.00, \$42.25, \$42.50, \$42.75, \$43.00, \$43.25, \$43.50, \$43.75, \$44.00, \$44.25, \$44.50, \$44.75, \$45.00, \$45.25, \$45.50, \$45.75, \$46.00, \$46.25, \$46.50, \$46.75, \$47.00, \$47.25, \$47.50, \$47.75, \$48.00, \$48.25, \$48.50, \$48.75, \$49.00, \$49.25, \$49.50, \$49.75, \$50.00, \$50.25, \$50.50, \$50.75, \$51.00, \$51.25, \$51.50, \$51.75, \$52.00, \$52.25, \$52.50, \$52.75, \$53.00, \$53.25, \$53.50, \$53.75, \$54.00, \$54.25, \$54.50, \$54.75, \$55.00, \$55.25, \$55.50, \$55.75, \$56.00, \$56.25, \$56.50, \$56.75, \$57.00, \$57.25, \$57.50, \$57.75, \$58.00, \$58.25, \$58.50, \$58.75, \$59.00, \$59.25, \$59.50, \$59.75, \$60.00, \$60.25, \$60.50, \$60.75, \$61.00, \$61.25, \$61.50, \$61.75, \$62.00, \$62.25, \$62.50, \$62.75, \$63.00, \$63.25, \$63.50, \$63.75, \$64.00, \$64.25, \$64.50, \$64.75, \$65.00, \$65.25, \$65.50, \$65.75, \$66.00, \$66.25, \$66.50, \$66.75, \$67.00, \$67.25, \$67.50, \$67.75, \$68.00, \$68.25, \$68.50, \$68.75, \$69.00, \$69.25, \$69.50, \$69.75, \$70.00, \$70.25, \$70.50, \$70.75, \$71.00, \$71.25, \$71.50, \$71.75, \$72.00, \$72.25, \$72.50, \$72.75, \$73.00, \$73.25, \$73.50, \$73.75, \$74.00, \$74.25, \$74.50, \$74.75, \$75.00, \$75.25, \$75.50, \$75.75, \$76.00, \$76.25, \$76.50, \$76.75, \$77.00, \$77.25, \$77.50, \$77.75, \$78.00, \$78.25, \$78.50, \$78.75, \$79.00, \$79.25, \$79.50, \$79.75, \$80.00, \$80.25, \$80.50, \$80.75, \$81.00, \$81.25, \$81.50, \$81.75, \$82.00, \$82.25, \$82.50, \$82.75, \$83.00, \$83.25, \$83.50, \$83.75, \$84.00, \$84.25, \$84.50, \$84.75, \$85.00, \$85.25, \$85.50, \$85.75, \$86.00, \$86.25, \$86.50, \$86.75, \$87.00, \$87.25, \$87.50, \$87.75, \$88.00, \$88.25, \$88.50, \$88.75, \$89.00, \$89.25, \$89.50, \$89.75, \$90.00, \$90.25, \$90.50, \$90.75, \$91.00, \$91.25, \$91.50, \$91.75, \$92.00, \$92.25, \$92.50, \$92.75, \$93.00, \$93.25, \$93.50, \$93.75, \$94.00, \$94.25, \$94.50, \$94.75, \$95.00, \$95.25, \$95.50, \$95.7

**Pullers Nail—**  
Belts, 1/2 doz., \$24.00, 40%  
Economy, 1/2 doz., \$5.50, 100%  
Giant, No. 1, 1/2 doz., \$18.00, 100%  
Giant, No. 2, 1/2 doz., \$15.00, 100%  
Pelican, 1/2 doz., \$30.00, 25%  
Scranton, 1/2 doz., \$18.00, 38%  
100% 100%

**Pulleys—**  
Brass Screw, 70%  
Hay Fork, "Anti-Friction" 5 in. solid, \$5.70  
Hay Fork, "F" Common and Patent Bushed, 20%  
Hay Fork, Moore's Anti-Friction 5 in. Wheel, \$12.00, 40%  
Hay Fork, Reed's Self-Lubricating, 60%  
Hay Fork, Solid Eye, \$4.00, 50%  
Hay Fork, 50% 100% 100%  
Hay Fork, Stearns' Nos. 35 & 46, 50% 100%  
Hay Fork, Stearns' Nos. 15, 25, 56, 66, 60%  
Hay Fork, Tarbox Pat. Iron, 20%  
Hot House, Awning, 60%  
Japanned Clothes Line, 60% 100%  
Japanned Side, 70% 100%  
Japanned Side, 70% 100%  
Moore's Ceiling or End, Anti-Friction, 40%  
Moore's Dumb Waiter, Anti-Friction, 50%  
Moore's Electric Light, 38%  
Moore's Side, Anti-Friction, 60%  
Dash (Auger Mortise), 60%  
Common Sense, 60%  
Empire, 60%  
Acme, 60%  
Ideal, Nos. 2, 4, 10 & 15, 50% less 1%  
Star, 60%  
Ideal, or IXL No. 60, 50%  
On bill, lot extra 5%  
Shade Rack, 45%  
Shepard's Draw Bar, 25%  
Tackle Blocks—See Blocks.

**Pumps—**  
Cistern, Best Makers, 60% 100%  
Pitcher Spout, Best Makers, 70% 100%  
Pitcher Spout, Cheaper G'ds, 70% 100%  
Myers' Pumps, low list, 50%

**Punches—**  
Avery's Revolving, 40%  
Avery's Sawset and Punch—See Sawsets  
Bemis & Call Co.'s Cast Steel Drive, 50%  
Bemis & Call Co.'s Check, 50%  
Bemis & Call Co.'s Spring, 50%  
Bemis & Call Co.'s Springfield Socket, 50%  
Niagara Hollow Punches, 50%  
Niagara Solid Punches, 50%  
Rice Hand Punches, 15%  
Saddler's or Drive, good, 60%  
Spring, good quality, 60%  
Spring, Leach's Pat., 15%  
Solid Tinner's, P., S. & W. Co., 60%  
Tinner's Hollow Punches, P., S. & W. Co., 20%  
Co., 20%

**Rail—**  
Barn Door, Light, In, 1/4, 1/2, 3/4  
Per 100 feet, \$1.75 2.10 2.75  
B.D. for N.E. Hand, Small, Med. Large.  
Per 100 feet, \$2.00 2.50 3.00 Net  
Carrier, double braced, Steel Rail, 3/4 foot  
Lundy Parlor Door, Planed Edge, 1/4 ft. 7/8  
Moody Steel Rail, 1/4 ft. 5/8, 45%  
Moore's Steel Rail, 1/4 ft. 5/8, 45%  
Sliding Door, Iron, Painted, 1/4 ft. 5/8, 45%  
Sliding Door, Wrt. Brass, 1/4 ft. 5/8, 45%  
Terry's Steel Rail, 1/4 ft. 5/8, 45%  
Victor Track Rail, 1/4 ft. 5/8, 45%

**Rakes—**  
Cast Steel, Association G'ds, 70% 100%  
Cast Steel, outside G'ds, 70% 100%  
Malleable, good, 70% 100%  
Malleable, low grade, 70%  
Fort Madison, Hixie Bow Brace and Peerless, 60%  
Fort Madison Steel Tooth Lawn Rake, \$6.00, 25%  
Gibbs' Acme, 40%  
Gibbs' Canton Lawn Rake, 40%  
Gibbs' Crown Lawn Rake, No. 1, 40%  
Gibbs' Favorite Lawn Rake, 40%  
Gibbs' Hustler No. 0, 40%  
Gibbs' Hustler No. 1, 40%  
Onida Lawn Rake, 40%

**Razors—**  
Campbell Cutlery Co., 50%  
Electric Cutlery Co., 50%  
Jordan's AAAI, new list, 50%  
Jordan's Old Faithful, new list, 50%  
Jordan's Razor Co., 50%  
Wootenholm and Butcher, \$10 to 2, 10%

**Razor Strops—**  
See strops, Razor.

**Reels—**  
Clothes Line—  
Stearns', 33% 100%

**Fishing—**  
Hendryx Aluminum, German Silver, Gold, Bronze, Silver Rubber, Popul and Salmon, Single Action, Multiplying and Quadruple, all sizes, 25%  
Hendryx Single Action Series, 102P and PN, 202P and PN, 304P and PN, 5004P and PN, 502 and 502N, 802 and 82N, 02084N, Competitor, 50%  
Hendryx Multiplying and Quadruple Series, 3004N and PN, 4N and PN, 2804N, 3004P and PN, 02084PN, 0024 and 0024N, 5000N and PN, 40% 100%

**Registers—**  
Moore's Bronze Finishes, 70%  
Moore's Electroplated, 75%  
Moore's Japanned, 75%  
Moore's Solid Bronze, 65%  
Moore's Stove Pipe, 35%

**Rings and Ringers—**  
Bull Rings—  
Ellrich Hdw. Co., White Metal, low list, 50% 100%

**Hog Rings and Ringers**  
Note—The market on Hog Rings and Ringers is in a demoralized condition and prices are low and irregular. We therefore withdraw quotations for the present.

**Rivets and Burrs—**  
Coppered Iron, Betina Brand, 50%  
Iron Norway, list Nov. 17 '87, 60%  
Second Quality, 70% 100%

**Rivet Sets—See Sets.**  
**Roasting and Baking Pans—See Pans, Roasting and Baking.**

**Rollers—**  
Acme Moore's Anti-Friction, 55%  
Barn Door, Sargent's list, 60% 100%  
Moore's Barn Door Stay, 50%  
Union Barn Door Roller, 70%  
Thompson Mfg. Co.'s Lawn Rollers, 30%

**Rope—**The following prices are for New York or factory, and as shown on large lots; terms, 1% for cash.  
Manila, 7-16 in. diam. and larger, 74%  
Manila, 1/4 and 5-16 in. diam. 74%  
Manila, Tarred Rope, 74%  
Manila, Hay Rope, Medium, 74%  
Sisal, 7-16 in. and larger, 64%  
Sisal, 1/4 and 5-16 in. diam. 64%  
Sisal, Hay Rope, 64%  
Sisal, Tarred Rope, 64%  
Sisal, Medium Lath Yarn, 64%  
New Zealand, 7-16 in. and larger, 54%  
New Zealand, 1/4 inch, 54%  
New Zealand, 1/4 and 5-16 in. diam. 54%  
New Zealand, Hay Rope, 54%  
New Zealand, Tarred Rope, 54%  
Cotton Rope, 12 @ 15%  
Jute Rope, 12 @ 15%

**Wire—**  
List February, 1892. All kinds, 50%

**Rules—**  
Boxwood, 50% 100%  
Ivory, 50% 100%  
Starrett's Steel Rules and Straight Edges, 25% 100%

**Sad Irons—See Irons, Sad.**

**Sand and Emery Paper and Cloth—**  
See Paper and Cloth.

**Sash Cord—See Cord, Sash.**

**Sash Locks—See Locks, Sash.**

**Sash Weights—**  
See Weights, Sash.

**Sausage Stuffers or Fillers—**  
See Stuffers or Fillers, Sausage.

**Saws—**  
Note—Extra 50% 100% often given.

Atkins' Circular, 50% 100%  
Atkins' Cross Cut, new list, 45%  
Atkins' Muley, Mill and Drag, 50% 100%  
Atkins' One Man Saw, 40%  
Atkins' Wood Saws, 40%  
Disston's Circular, 45% 100%  
Disston's Cross Cut, list Jan. 1, '93, 40% 100%  
Disston's Hand, 25%  
C. B. Jennings & Co.'s, 25%  
Peace Circular and Mill, 45% 100%  
Peace Cross Cut, list Jan. 1, '93, 45% 100%  
Peace Hand, Panel and Rip, 25% 100%  
Richardson's Circular and Mill, 45% 100%  
Richardson's X Cuts, list Jan. 1, '93, 45% 100%  
Richardson's Hand, 25%  
Simonds' Circular Saws, 45% 100%  
Simonds' Crescent Ground Cross Cut Saws, 30%  
Simonds' One Man Cross Cut, 40% 100%  
Simonds' Gang, Mill, Muley and Drag, 45% 100%  
Wheeler, Madden & Clemson Mfg. Co. Cross Cut, list Jan. 1, 1893, 45% 100%  
Hand, Panel and Rip, 30% 100%  
Wheeler & MacFarlin, 45% 100%  
Cross Cut, list Jan. 1, 1893, 45% 100%  
Hand, Panel and Rip, 25% 100%

**Hack Saws—**  
Eureka and Crescent, 25%  
Griffin's, complete, 40% 100%  
Griffin's Hack Saw, 40% 100%  
Star Hack Saws and Blades, 25%

**Scroll—**  
Barnes' Builders' and Cab Makers' \$15.25  
Barnes' Scroll Saw Blades, 35%  
Lester, complete, \$10.00, 25%  
Rogers, complete, \$4.00, 25%

**Saw Frames—**  
See Frames, Saw.

**Saw Sets—See Sets, Saw.**

**Saw Tools—See Tools, Saw.**

**Scale Beams—**  
See Beams, Scale.

**Scales—**  
Chatillon's Eureka, 25%  
Chatillon's Favorite, 40%  
Chatillon's Grocers' Trip Scales, 50%  
Family, Turnbills, 30% 100%  
Hatch, Counter, No. 171, good quality, 40%  
Hatch, Tea, No. 161, 40%  
Rehbe Bros' Platform, 40% 100%  
Union Platform, Plain, 30% 100%  
Union Platform, Striped, 30% 100%

**Scissors, Fluting—**  
45%

**Scrapers—**  
Adjustable Box Scraper (S. R. & L. Co.), \$6.00, 40% 100%  
Box, 1 Handle, 40%  
Box, 2 Handle, 40%  
Defiance Box and Ship, 40%  
Rope, Common, 40%  
Ship, R. I. Tool Co., 10%

**Screen Window and Door Frames—See Frames.**

**Screw Drivers—**  
See Drivers, Screw.

**Screws—**  
**Bench and Hand—**  
Bench, Iron, 55% 100%  
Bench, Wood, Beech, 25%  
Bench, Wood, Hickory, 25%  
Hand, Wood, 25%  
Hand, Grand Rapids, list, 35%

**Coach, Lag and Hand-Rail—**  
Lag, Blunt Point, list Jan. 1, 1890, 80% 100%  
Coach and Lag, Gimlet Point, list Jan. 1, 1890, 80% 100%  
Hand Rail, Am. Screw Co., 75%  
Willard Rail, E. & B. Mfg. Co., 70% 100%  
Hand Rail, Sargent's, 70% 100%

**Jack Screws—**  
Millers Falls, 50% 100%  
Millers Falls, Roller, 50% 100%  
P. S. & W., 35%  
Sargent's, 70%  
Stearns', 40% 100%

**Cork—**  
Detroit Cork Screw Co., 35%  
Humason & Beckley Mfg. Co., 40% 100%  
Williamson's, 35%  
Williamson's Forged Worm, 35%  
Wood, Handle, 1 doz., \$5.00, 40%

**Machine—**  
Flat Head Iron, 70%  
Round Head Iron, 65%

**Wood—**  
List January 1, 1891.  
Flat Head Iron, 80%  
Round Head Iron, 75%  
Flat Head Brass, 80%  
Round Head Brass, 75%  
Flat Head Bronze, 80%  
Round Head Bronze, 75%  
Rogers' Drive Screws, 35%

**Scroll Saws—See Saws, Scroll.**

**Scythes—**  
Grain, 40% 100%  
Grass, 40% 100%

**Scythe Snaths—**  
See Snaths, Scythe.

**Sets—**  
**Awl and Tool—**  
Alken's Sets, Awl, Tool and Tools, No. 20, 1/2 doz \$10.00, 60% 100%  
Common Brad Sets, No. 42, \$10.50, No. 43, \$12.50, 70% 100%  
Fray's Adj. Tool Hds., Nos. 1, \$12; 2, \$18; 3, \$12; 4, \$2; 5, \$7, 50%  
Henry's Combination Haft, 50%  
Miller's A.C.J. Tool Hds., No. 1, \$2.50, No. 2, \$1.50, No. 3, \$1.80, 25%  
Stanley's Excelsior, No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50, 30% 100%

**Nail—**  
Round, 1/2 gr. \$3.25  
Square, 1/2 gr. \$4.00  
Buck Bros., 1/2 gr. \$3.25  
Cannon's Diamond Point, 1/2 gr. \$3.25

**Rivet—**  
Regular list, 70%

**Saw—**  
Atkins' Criterion, 1/2 doz No. 1, \$8.00, 40%  
Atkins' Genuine, 1/2 doz, 50% 100%  
Atkins' Int. Action, 1/2 doz \$3.00, 25%  
Atkins' Lever, 1/2 doz No. 1, \$8.00, 40%  
Avery's Saw Set and Punch, 50%  
Bemis & Call Co.'s Cross Cut, 30% 100%  
Bemis & Call Co.'s Plate, 30%  
Bemis & Call Spring Hammer, 30% 100%  
Common Lever, 1/2 doz \$2.00, 45% 100%  
Crescent, 1/2 doz \$3.00, 45%  
Crescent (Keller), No. 1, \$16.00; No. 2, \$24.00, 40% 100%  
Disston's Star, 25%  
Hammer, Bemis & Call Co.'s new Pat. 45%  
Hammer, Hotchkiss, \$5.50, 10%  
Hart's Pat. Lever, 20%  
Kohler's Giant Royal, 1/2 doz \$7.00, 40%  
Kohler's Royal, 1/2 doz \$7.00, 40%  
Leach's, No. 0, \$8.00; No. 1, \$15.00, 15% 20%  
Leopold, 40% 100%  
Lloyd's Acme, 1/2 doz \$15.00, 40% 100%  
Morrill's No. 1, \$15.00, 40% 100%  
Nos. 3 and 4, Cross Cut, \$23.00, 40% 100%  
No. 5, Mill, \$31.00, 40% 100%  
No. 6, Mill, 40% 100%  
No. 11, \$16.00, 40% 100%  
Nash's, 20% 100%  
Stillman's Genuine, 1/2 doz \$5.00, 70%  
Stillman's Pattern, Hand, 1/2 doz \$3.25, 40%  
Cross Cut, \$5.50, 55% 100%  
Taintor Positive, 1/2 doz \$18.00, 40%

**Sharpeners, Knife—**  
Parkin's, 40%  
Applewood Handles, 1/2 doz \$6.00, 50%  
Applewood or Corobola, 1/2 doz \$9.00, 50%  
Tanite Mills, 1/2 gr. \$11.40, 25% 100%

**Shaves, Spoke—**  
Iron, 45%  
Wood, 30%  
Bailey's (Stanley R. & L. Co.), 50% 100%  
Cincinnati, 25% 100%  
Goodell's 1/2 doz \$9.00, 25%  
Stearns', 40% 100%

**Shears—**  
Acme Cast Shears, 10% 100%  
American (Cast) Iron, 40% 100%  
Barnard's Lamp Trimmer, 1/2 doz \$3.75, 75%  
Barnard's Solid Steel Blade, Jap'd, 75%  
Barnard's Solid Steel Blade, Nicked, 65%  
Cast Steel Trimmers, 40%  
First quality, 80% 100%  
Second quality, 50% 100%  
Campbell Cutlery Co., Jap'd, 75%  
Clamp Plated, 65%  
Claude brand, Japanned, 70%  
Claude brand, Nicked, same list, 65%  
Clipper, 10% 100%  
Davenport Cutlery Co., 60% 100%  
Diamond Cast Shears, 10% 100%  
Galvanic 3/4 to 1 lb., 1/2 doz \$1.00, 1/2 inch Hatch Cutlery Co. Solid Steel Forged, 60% 100%  
Heinrich's, List Dec. 1881, 60% 100%  
Heinrich's Tailor's Shears, 35%  
Howe Bros. & Hulbert, Solid Forged Steel, 40%  
Seymour's, List Dec. 1881, 60% 100%  
Victor Cast Shears, 75% 100%

**Tinner's Snips—**  
Cast Handles, Laid with Steel, 40%  
Niagara Snips and Shears, 80% 100%  
Wrt. Handles, Steel Blades, 1/2 doz \$10.00, 40%

**Pruning Shears and Hook**  
Disston's Combined Pruning Hook and Saw, 1/2 doz \$18.00, 20% 100%  
Disston's Pruning Hook, 1/2 doz \$12.00, 20% 100%  
Dunlap's Saw and Chisel, 1/2 doz \$8.50, 30%  
Henry's Pruning Shears, 1/2 doz \$4.00, 25%  
Henry's Tree Pruner, 60% 100%  
Levin's Pruning Shears, 1/2 doz \$10.00, 70%  
Levin Pruner No. 1, \$15.00, 40% 100%  
Levin Pruner No. 2, \$21.00, 40% 100%  
J. Mallinson & Co., No. 1, \$5.25; No. 2, \$7.35, 35%  
Pruning Shears, Henry's Pat., 20%  
Pruning Shears, Conn. Pat., \$3.00, 30%  
P. S. & W. Co., \$2.50, 30%  
Wheeler, M. & C. Co., Combination, 1/2 doz \$12.00, 40%

**Tinner's, &c.—**  
Shears and Snips (P. S. & W.), 20% 100%  
Snips, J. Mallinson & Co., 35% 100%

**Shelves—**  
**Sliding Door**  
Corbin's list, 60% 100%  
M. W. Co., list July, 1888, 50% 100%  
Moore's Anti-Friction, 50%  
Patent Roller, 60% 100%  
Patent Roller, Hatfield's, 75%  
R. & E., list Dec. 18, 1888, 55% 100%  
Russell's Anti-Friction, list Dec. 18, 1888, 60% 100%

**Shells—**  
**Sliding Shutter**  
Reading list, 60% 100%  
R. & E., list Dec. 18, 1888, 60% 100%  
Sargent's list, 70%

**Shells**  
Brass Shot Shells, Club, Rival, Climax, 65% 100%  
Brass Shot Shells, 1st quality, 60% 100%  
First quality 4, 8, 10 and 12 gauge, 25% 100%  
First quality Rival, Club and Climax brands, 14, 16 and 20 gauge, 25% 100%  
First quality Rival, Club and Climax brands, 14, 16 and 20 gauge, 25% 100%  
Prime, 40% 100%  
Smokeless brand, 12, 10, 16 gauge, 40% 100%  
Star, Club, Rival and Climax brands, 35% 100%  
Trap brand, 12 and 10 gauge, 35% 100%  
Shells, Loaded—  
Standard List, July 19, 1890, 40% 100%  
40% 100%  
2% cash, 10 days.

**Ship Tools—**  
L. & J. White, 20%

**Shoes, Horse Mule, &c.**

**Horse—**  
Burden's, Perkins', Phoenix, Standard, Diamond State, Brydens' Bore' and Crescent, \$3.50, \$4.00  
Bryden's Frog Pressure, at factory, \$5.10

**Mule—**  
Add 1/2 % keg to above prices.

**Ox Wrought—**  
Ton lots, 1000 lb lots, 1/2 doz \$9.00  
500 lb lots, 1/2 doz \$9.00

**Shot—**  
Drop, up to B, 25-b bag, \$1.10  
Drop, up to B, 5-b bag, 1.30  
Drop, B and larger, 25-b bag, 1.50  
Drop, B and larger, 5-b bag, 1.35  
Buck and Chilled, 25-b bag, 1.35  
Buck and Chilled, 5-b bag, 1.35  
Dust Shot, 25-b bag, 1.30  
Dust Shot, 5-b bag, 1.30

**Shovels and Spades**  
Ames' Shovels, Spades, &c., list Nov. 1, 1885 (Except Nos. named below) 20%  
The following Nos. are subject to a discount of 27%: Nos. 548 to 572; 838 to 880; and Nos. 1004, 1009, 1014, 1019, 1024, 1027 and 1029.  
Griffith's Black Iron, 50% 100%  
Griffith's C. S., 60% 100%  
Griffith's Solid C. S. R. Goods, 20%  
Hubbard & Co., list Nov. 1, 1885, 25%  
Hubbard & Co.'s Chisholm Pattern, 50% 100%  
Hussey, Blans & Co., 15% 25%  
H. M. Myers Co., 30%  
Lehigh Mfg. Co., 50% 100%  
St. Louis Shovel Co., 20% 100%  
Paine Petteshore & Son, 35%  
Rowland's (Lowman's Pat.) 40% 100%  
Rowland's Black Iron, 60% 100%  
Rowland's Steel, 60% 100%  
Terra Haute Shovel & Tool Co., 25%

**Shovels and Tongs**  
Brass Head, 60% 100%  
Iron Head, 60% 100%

**Sieves and Sifters**  
A. & W. Sifters, 1/2 gr \$15.00  
Buffalo Metallic, S. S. & Co., 60% 100%  
Electric Light, 1/2 doz \$1.50, 1/2 gr \$15.00  
Hunter's Genuine, 1/2 doz \$1.75, 1/2 gr \$16.00  
Hunter's Imitation, 1/2 doz \$1.75, 1/2 gr \$15.00  
Mann's Tin Rim, 1/2 doz \$1.75, 1/2 gr \$15.00  
Shaker (Barlier's Pat.) Flour Sifters, 1/2 gr \$21.00

**Sieves, Wooden Rim—**  
Meah 18, Nested, 1/2 doz \$0.80, 1/2 gr \$1.00  
Meah 20, Nested, 1/2 doz \$0.95, 1/2 gr \$1.10  
Meah 24, Nested, 1/2 doz \$1.15, 1/2 gr \$1.35

**Sinks—**  
**Cast Iron—**  
Standard list, 65% 100%  
**Wrought Steel—**  
Columbus, galvanized and enameled, 50% 100%  
Columbus Painted, 30% 100%  
New Era, Painted, 50% 100%  
New Era Galvan. 161 and Enameled, 70% 100%

**Skels, Thimble—**  
Wentworth's, 75% 100%  
Coldbrookdale Iron Co., 60%  
Columbus Wrt. Steel, Special net prices  
Seneca Falls Pattern, 75%  
Utica P. S. T. Skels, 60%  
Utica Turned and Fitted, 35%

**Slates—**  
School, by case, 50% 100%  
Large lots, 60% 100%

**Saw Cutters—See Cutters.**

**Slips, Hand—**  
Tubular Steel, 1/2 doz \$24.00, 40% 100%  
Lots of 5 doz, 50%

**Snaps, Harness, &c.**

Anchor T. & S. Mfg. Co.	60¢
Andrews	50¢
Covert's Saddlery Works, Triumph	38¢
Covered Spring	60¢10¢10¢
Covert	50¢10¢5¢2¢
Covert, New Patent	50¢10¢5¢2¢
Covert, New R. E.	60¢10¢5¢2¢
Fitch's (Bristol)	60¢10¢
German, new list	40¢10¢
Ketchikan	10¢
Kelly & Woolworth's Steel Harness	50¢10¢60¢
John Prots Snaps	75¢75¢5¢
Sargent's Patent Guarded	70¢10¢10¢

**Snaths—**

Scythe	50¢2¢50¢10¢
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**Soldering Irons—**

See Irons, Soldering.

**Spittoons, Cuspidors, &c.**

Standard Fiberglass	
Cuspidors, 3/4-inch, # doz., No. 5, 8, No. 52, 88.	
Spittoons, Daisy, 3-inch, No. 1, 10 and 11 inch, #6.	

**Spoke Shaves—**

See Shaves, Spoke.

**Spoke Trimmers—**

See Trimmers, Spoke.

**Spoons and Forks—**

Tinned Iron—

Basting, Cen. Stamp. Co.'s list	70¢25¢
Buffalo, S. S. & Co.	38¢42¢
Solid Table and Tea, Cen. Stamp. Co.'s list	70¢25¢

**Silver Plated—**

4 months or 5¢ cash 30 days:	
L. Boardman & Son	50¢12¢
Holmes & Edwards Silver Co.	40, 15¢5¢
Meriden Brit. Co., Rogers	40¢15¢
Reed & Barton	40¢15¢
Rogers & Bros.	40¢15¢
O. Rogers & Bros.	40¢15¢
Rogers & Hamilton	40¢15¢
Wm. Rogers Mfg. Co.	40, 15¢5¢
Simpson, Hall, Miller & Co.	40, 15¢5¢

**Miscellaneous—**

Boardman's Britannia Spoons, case lots	60¢5¢ cash
Boardman's Nickel Silver, list July 1, 1891	60¢7¢25¢
Britannia	60¢60¢25¢
German Silver	60¢60¢25¢
Nickel Silver	60¢60¢25¢ cash
Holmes & Edwards Silver Co.	50¢10¢25¢
No. 30 German Silver	50¢10¢25¢
No. 30 Silver Metal	50¢10¢25¢
No. 40 Nickel Silver	50¢10¢25¢
No. 50 Nickel Silver	50¢10¢25¢
No. 67 Mexican Silver	50¢10¢25¢
Rogers & Hamilton:	
Cinetar, Steel Goods	40¢15¢5¢
Cinetar, Steel Goods	40¢10¢
Crown Hamilton, Flatware and Cutlery	30¢
Steel Goods	40¢10¢
Wm. Rogers Mfg. Co.:	
18¢ Rogers' German Silver	60¢6¢
22¢ Rogers' Nickel Silver	60¢6¢
Rogers' Silver Metal	50¢10¢25¢

**Spring Door—**

Champion Coll.	60¢10¢60¢10¢10¢
Cowell's, No. 1, # doz \$18.00; No. 2, \$15.00	
Gem (Coll), list April 19, 1888	20¢
Hercules	50¢50¢10¢
Phenix	35¢
Rubber, complete, # doz \$4.50	55¢10¢
Star (Coll), list April 19, 1888	20¢10¢
Torrey's Rod, 39 in.	# doz \$1.20¢1.25
Warner's No. 1, # doz \$1.50; No. 2, \$3.40	
Victor (Coll)	60¢10¢60¢10¢25¢

**Carriage, Wagon, &c.**

Elliptic, Concord, Platform and Half	
Roll	60¢10¢60¢10¢10¢ or net prices
Oliver's Roller Springs	25¢
Sprinklers, Lawn—	
Gibbs' Arc	# doz., \$12.00
Gibbs' Hustler	# doz., \$6.00

**Squares—**

Nickel-Plated	30¢10¢10¢65¢25¢
Steel and Iron T Bevels	80¢10¢10¢
Avery's Level Protractor	50¢
Avery's Finish Bevel Squares	40¢
Dialton's Try Square and T Bevels	50¢
Starrett's Micrometer Caliper Squares	25¢

Winterbottom's Try and Miter... 30¢10¢

**Squeezers—**

Blair's	# doz \$2.00
Blair's "Climax"	# doz \$1.00

**Lemon—**

Porcelain Lined, No. 1	# doz \$3.00
Wood, Common	# doz \$1.70¢1.75
Wood, No. 2	# doz \$3.00, 95¢
Dean's, No. 1	# doz \$5.50; 2, \$3.35; 3, \$1.90; Queen, \$2.50
Dunlap's Improved	# doz \$3.75, 20¢
Hotchkins Straight Flash	# doz \$2.00
Jennings' Star	# doz \$2.50
King	40¢5¢
Little Giant	50¢50¢25¢
Sammis, No. 1, \$5.00; No. 2, \$9; 12, \$18 # doz	
The Boss	# doz \$2.50

**Standard Fiber Ware—**

See Ware, Standard Fiber.

**Staples—**

Barbed Blind, 1/4 in. and larger, # 7¢7¢4¢	
Barbed Blind, 1/4 in.	# 8¢8¢4¢
Fence Staples, Galvanized, Same Price	
Fence Staples, Plain	as Brb Wire
Grand Crossing Tack Co.'s list	75¢10¢

**Steels Butchers—**

C. & A. Hoffmann's	40¢
Nichols Bros.	60¢

**Steelyards and Dies—**

Blacksmith's	
Butterfield's Goods	35¢
Waterford Goods	35¢
Gardner	25¢
Gran River	50¢50¢
Lighting Screw Plate	25¢20¢
Reece's New Screw Plates	50¢30¢
Reversible Ratchet	30¢

**Stone—**

Grindstones—

Scythe Stones	
Pike Mfg. Co, list April, 1892	88¢4¢
Cleveland Stone Co., list Nov 1892	85¢4¢

**Oil Stones, &c.**

Pike Mfg. Co.	
Hindatan No. 1, # D	5¢
Sand Stone	5¢
Turkey Oil Stone, 4 to 8 in	40¢40¢
Lilly White Washita	80¢
Rosy Red Washita	80¢
Washita Stone, Extra	50¢
Washita Stone, No. 1	40¢
Washita Stone, No. 2	30¢
Lilly White Slips	90¢
Rosy Red Slips	90¢
Washita Slips, Extra	80¢
Washita Slips, No. 1	70¢
Arkansas Stone, No. 1, 3 to 5 in, \$3.50	
Arkansas Stone, No. 15, 3 to 5 in, \$3.50	
Lake Superior	# D 18¢
Lake Superior Slips	# D 18¢
Tanite Mills:	
Emery Oil	# doz., \$9.00, 50¢95¢

**Stops, Bench—**

Cincinnati	25¢10¢
Frederick	# doz \$1.50
Hotchkiss' # doz \$3	10¢10¢10¢
McGills # doz \$3	25¢
Millers Falls	25¢
Morrill's, # doz, No. 1, \$10.00; No. 2, \$11.00	
Stearns'	40¢20¢
Terrell's Nos. 1 and 2, # doz., \$3; No. 3, \$3.50	
Weston's, No. 1, \$10. No. 2, \$9.25¢10¢5¢	

**Stove Polish—**

See Polish, Stove.

**Stretcher, Carpet—**

Cast Iron, Steel Polish	# doz 75¢80¢
Cast Steel, Polished	# doz \$2.25
Socket	# doz \$1.75
Bullard's	25¢10¢40¢

**Strops Razor—**

Badger's Belt and Com.	# doz \$2.00
Campbell Cutlery Co.	Net prices
Genius Emerson	60¢10¢25¢
Imitation	# doz \$2.00, 20¢10¢25¢
Jordan's Pat. Padded, list Nov. 1, '89, 50¢	
Lamont Combination	# doz \$4.00
Torrey's	Net prices

**Stuffer Sausage—**

Miles Challenge, # doz \$20	50¢50¢5¢
Ferry # doz, No. 1, \$15.00; No. 2, \$10.00	
Draw Cut No. 4, each \$30.00	20¢
Enterprise Mfg. Co., list Jan 17, '93	25¢
Silver's	40¢10¢

**Sweepers, Carpet and Lawn—**

Acme	# doz \$26.00
Advance	# doz \$18.00
Banner Jap'd, # doz, \$22.00; Nickel, \$24.00	
Gold Medal	# doz \$27.00
Prize	# doz \$27.00
Superior	# doz \$27.00
Cosmopolitan	# doz \$27.00
Furniture Protector, Jap.	# doz \$24.00
Furniture Protector, Nickel	# doz \$2.00
Hall	# doz \$27.00
Crown Jewel, No. 1, \$13.00; No. 2, \$19.00; No. 3, \$22.00	
Domestic	# doz \$21.00
Domestic, No. 2	# doz \$22.00
Easy Jap'd, # doz \$22.00; Nickel, \$24.00	
Excelsior	# doz \$22.00
Gilt Edge	# doz \$24.00
Grand Rapids	# doz \$24.00
Grand Republic	# doz \$23.00
Housewife's Delight	# doz \$15.00
Imperial	# doz \$26.00
Improved Parlor Queen	# doz \$24.00
Ornamented	# doz \$27.00
Nickel	# doz \$27.00
Ladies' Friend	# doz \$15.00
Ladies' Friend No. 2	# doz \$15.00
Model	# doz \$27.00
Parlor Queen	# doz \$24.00
Our Leader	# doz \$12.00
Our Own	# doz \$27.00
Rapid Jap'd, # doz, \$22.00; Nickel, \$24.00	
Refable	# doz \$22.00
Select	# doz \$24.00
Standard	# doz \$24.00
Supreme	# doz \$22.00
The Star	# doz \$21.00
Triumph	# doz \$27.00
Bissell Carpet Sweeper Co. make the following rebates:	
\$1.00 per doz. in 5 doz. lots.	
\$2.00 per doz. in 10 doz. lots.	

**Lawn—**

Thompson Mfg. Co.	30¢
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**Swings—**

Davies Lawn	25¢
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**Tacks, Brads &c.**

List October 19, 1889. Old established straight weights. Short Weight goods are sold at lower prices.

Carpet Tacks	
American, Blued	47¢4¢
American, Tin'd and Cop'd	52¢4¢
Steel, Bright and Blued	47¢4¢
Steel, Tinned and Coppered	52¢4¢
Swedes Iron, S. S., Blued	40¢
Swedes Iron, S. S., Tinned	47¢4¢
American Iron Tacks, Domestic	37¢4¢
American Iron Tacks, Foreign	50¢
Swedes Iron Tacks	
S. S., Blued	37¢4¢
S. S., Tinned	45¢
Lanc. Blued	30¢
Lanc. Tinned	37¢4¢
Upholsterers' S. S.	47¢4¢
Upholsterers' Lanc.	37¢4¢
General Tacks	
S. S., Blued	30¢
S. S., Tinned	42¢4¢
Lanc. Blued	20¢
Lanc. Tinned	35¢
Basket and Trimmers' Tacks—	
Lanc.	20¢
Hungarian Nails	35¢
Common and Patent Brads	35¢
Leathered Tacks	5¢
Brush Tacks and Nails, S. S.	20¢
Looking Glass Tacks, S. S.	5¢
Picture-Frame Prints, S. S.	12¢4¢
Lace Tacks, Blued	12¢4¢
Lace Tacks, Tinned	20¢
Finishing Nails	52¢4¢
Trunk and Clout Nails—	
Black	52¢4¢
Tinned or Coppered	57¢4¢
Basket Nails	37¢4¢
Chair Nails	35¢
Clair Box Nails	35¢
Tin Capped Nails	50¢

**Miscellaneous—**

Double Point	30¢10¢90¢10¢10¢
Wire Carpet Nails	60¢10¢60¢10¢10¢
Bill Nye Brad Box	# box \$1.50
Bonnie	# box \$4.00
Claw Handle Carpet	# gross \$4.00
Home Tacks, No. 50 # case (12 car- tons), \$36.00; No. 100, # case (12 car- tons), \$72.00	
Home Nails, No. 200, # case (12 car- tons), \$30.00; No. 400, # case (12 car- tons), \$60.00	
Parlan Gilt Nails, cartoon	50¢
Plymouth Rock Carpet Tacks	20¢
Upholsterers' Nails	50¢10¢

**Wire Brads and Nails**

Steel-Wire Brads, R. &amp; E. Mfg. Co.'s list

See also Nails, Wire.

**Tanks, Oil—**

Emerald, S. S. & Co.: 30-gal. \$8.75; 60-gal. \$11 each	
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**Tapes, Measuring—**

American	40¢10¢50¢
Chesterman's, Regular list	35¢80¢
Excelsior, Special list	20¢
Spring	40¢

**Thermometers—**

Tin Case	80¢80¢10¢
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**Thimble Skins—See Skins.****Ties, Bale—Steel.**

Standard Wire, list	50¢10¢25¢
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**Tinners' Shears, &c.—**

See Shears, Tinners' &amp;c.

**Tinware—**

Stamped, Japanned and Piced, list Jan 20, 1887	70¢10¢70¢25¢
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**Tire Benders, Upsetters, &c.—See Benders and Upsetters.****Tobacco Cutters—**

See Cutters, Tobacco.

**Tools Coopers—**

Albertson Mfg. Co.	25¢
Barton's	30¢30¢25¢
Beatty's	33¢4¢
Bradley's	20¢
Sandusky Tool Co.	30¢30¢25¢
Shaves Cincinnati Tool Co.	20¢
L. & J. White	20¢25¢

**Lumber—**

Cant Hooks, "Blue Line"	# doz \$16.00
Cant Hooks, Common Finish	# doz \$14.00
Cant Hooks, Mail Socket Clasp, "Blue Line" Finish	\$16.00
Cant Hooks, Mail Socket Clasp, Common Finish	# doz \$14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish	# doz \$14.00
Cant Hooks, Clip Clasp, Common Fin-	# doz \$12.00
Hand Spikes	# doz 6 ft., \$15.00; 12 ft., \$20.00
Pike Poles, Pike & Hook	# doz, 12 ft., \$11.50; 14 ft., \$12.50; 16 ft., \$14.50; 18 ft., \$17.50; 20 ft., \$21.50
Pike Poles, Pike only	# doz, 12 ft., \$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18 ft., \$15.00; 20 ft., \$20.00
Pike Poles, not ironed	# doz, 12 ft., \$6.00; 14 ft., \$7.00; 16 ft., \$9.00; 18 ft., \$12.00; 20 ft., \$16.00
Mail, Iron Socket Peavies	# doz \$19.00
King Peavies, "Blue Line"	# doz \$20.00
King Peavies, Common	# doz \$18.00
Steel Socket Peavies	# doz \$21.00
Setting Poles	# doz, 12 ft., \$14.00; 14 ft., \$15.00; 16 ft., \$17.00
Swamp Hooks	# doz \$18.00

**Saw—**

Atkins', new list	40¢
Simonds'	33¢4¢

**Transom Lifters—**

See Lifters, Transom.

**Traps—**

Blake's Patent	40¢10¢50¢
Newhouse	40¢10¢50¢5¢
Onida Pattern	75¢75¢10¢5¢

**Mouse and Rat—**

Cyclone	# gr \$5.25
Dandy	# doz., \$1.75
Hotchkiss Metallic Mouse, 5-hole traps	# doz., 75¢; in full cases, # doz. 60¢65¢
Hotchkiss Imp. Rat Killer	# gr \$18.50
Hotchkiss New Rat Killer	# gr \$16.50
Ideal	# doz \$12.00
Mouse, Bonanza	# doz 0.80¢1.00
Mouse, Cage, Wire	# doz \$2.50 10¢
Mouse, Catch-em-alive	# doz \$2.50 15¢
Mouse Wood, Choker	# doz holes, 9¢10¢
Mouse, Round Wire	# doz \$1.50, 10¢
Mouse, Round Wire	# gr \$10.00, 10¢
Schuyler's Rat Killer	# gr \$15.00
Waddell's Go Bang	# gr \$12.50

**Fly—**

Balloon, Globe or Acme	# doz. \$1.50, # gro. \$13.50
Harper, Champion or Paragon	# doz. \$1.75, # gro. \$16.50

**Triers—**

Butter and Cheese	25¢
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**Trimmers, Spoke—**

<b>Trimmers, Spoke-</b>	
Bonney's	# doz \$10.00, 50¢

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**JUNE 6, 1894.**

## IRON AND STEEL—

Burnt Iron.....	gross ton	2.50
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